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BUSINESS TECHNOLOGY LEADERSHIP

MASTERING MOBILE MADNESS

Your guide to supporting and securing a new generation of gadgets

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Enterprise portfolio management. It can drive your company's growth strategy too.

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Their largest application runs on new SQL Server™ 2005 64-bit running on Windows
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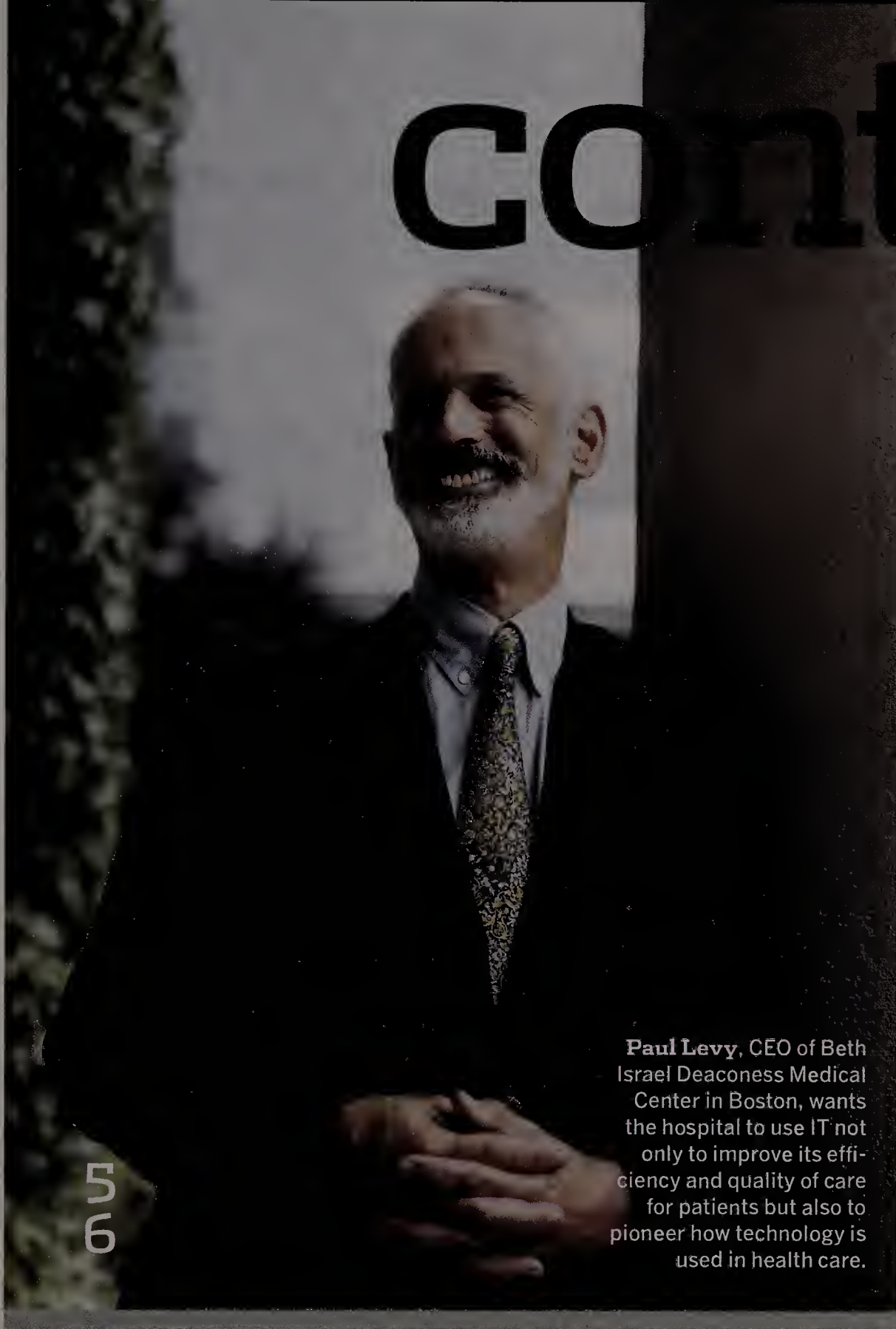
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Bah, Humbug!

The holidays are supposed to be the best of times, but if you're honest with yourself, you know they can be the worst

"The holidays," says Dr. Steven Berglas, a psychiatrist, executive coach, consultant and author, "are depressing."

I called Berglas to talk about holiday stress because, after all, 'tis the season, and because our cover story, "A Season on the Brink" (Page 62) by Senior Writer Meridith Levinson, focuses on the stress department stores have been under as they've tried (and, for the past few years, failed) to meet the holiday-season profit goals upon which their whole year's success depends.

But Berglas asserted that stress is a misnomer for what we experience over the holidays.

"It's not about stress," he told me. "Some *New York Times* writer once called it holiday stress, and we've been running around talking about stress ever since. The truth is, we're not stressed; we're depressed. And for good reason. It's a depressing season." (Berglas makes his *CIO* debut on Page 42 with "Serenity Found," a column about the difference between burnout and stress.)

Some of the reasons Berglas ticked off for why the holiday season is particularly depressing include the winter's failing light ("Every culture celebrates the winter solstice by lighting lights. Why? Because darkness is depressing."); the cold ("In the cold you hunch your shoulders. That causes you to contract your trapezius muscles. That gives you a pain in the neck."); advertising ("It tells you you should be happy—going around singing 'Jingle Bells'—but you're not, so you wonder, 'What's wrong with me?'"); and the grief that comes with end-of-year introspection ("Another year gone and I'm not where I want to be. Why aren't I doing better?").

Of course, not every reason why the holidays are hard for many of us is internal or can be ascribed to seasonal affective disorder. This is the time of year when many businesses have to make their nut. Not just in retail (although that's the most obvious example) but in all enterprises whose fiscal year syncs up with the calendar.

Our cover story reports on how two large department stores are using IT to reverse the depressing trend of falling holiday sales, but technology can do only so much for us as individuals. In fact, thanks to laptops, PDAs and their ilk, IT is making it easier for us to take our work with us on vacation. Some vacation.

So what is Dr. Berglas's prescription for fighting holiday depression?

If we get depressed in part because our expectations are high, lower them. "Let's admit that it's a depressing time," says Berglas. "Let's forget Hallmark and tell the truth."

And, to avoid hunching your shoulders and giving yourself a pain in the neck, remember Mom's advice: Don't forget your scarf.

"Some *New York Times* writer once called it holiday stress, and we've been running around talking about stress ever since. The truth is, we're not stressed; we're depressed. And for good reason. It's a depressing season."

—Dr. Steven Berglas

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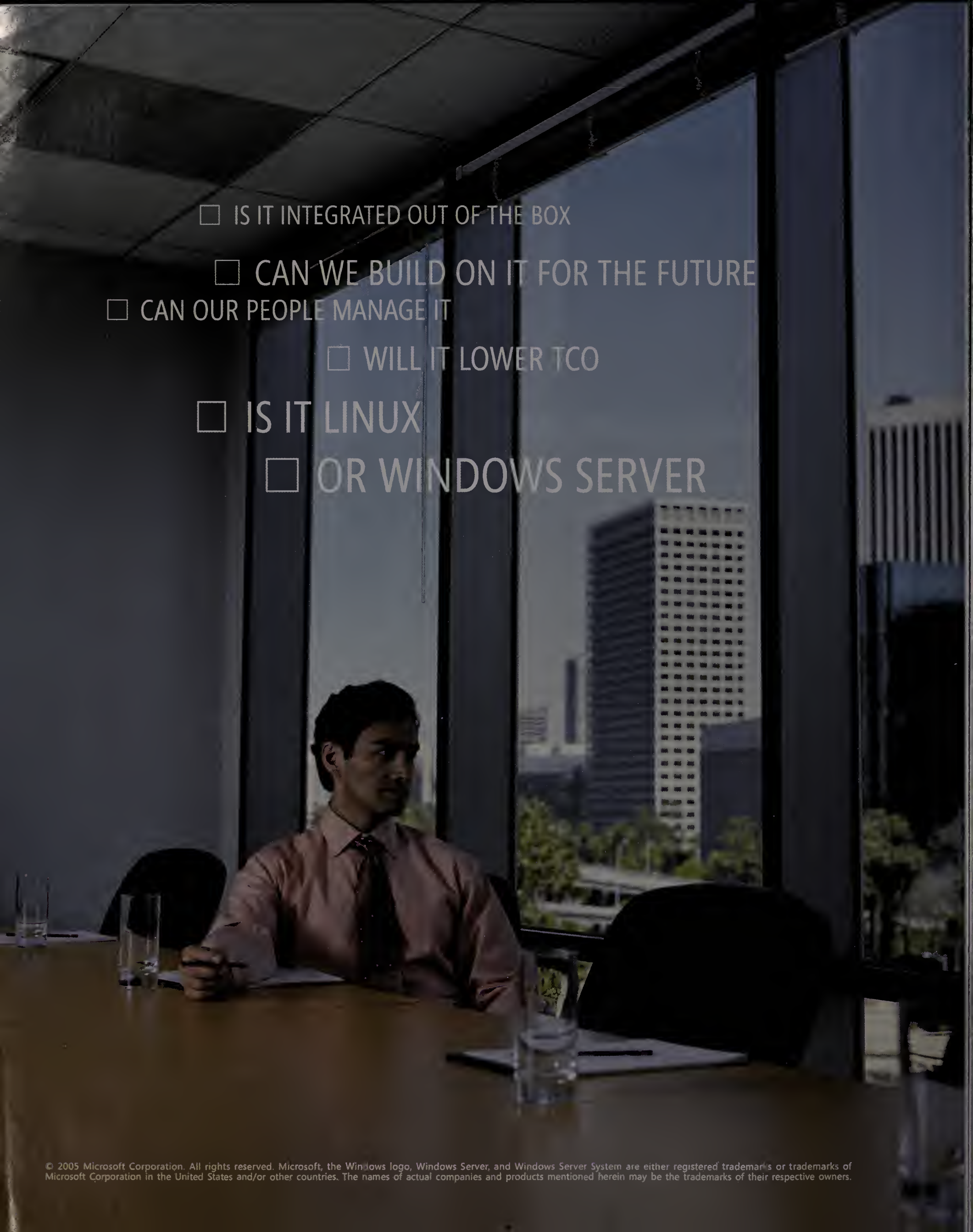
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InBox

The Disposal Dilemma

Luckily, my county offers free disposal of electronics ["When the Bits Bite the Dust," Oct. 1]. Any resident can drop off as much old computer equipment (or other electronics) as they wish. The only downfall is that residents must bring the items themselves.

Do a search for your city or county name, with "hazardous materials" and you may be surprised what you find.

CHAD NESS

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I recently presented at a conference held at Santa Clara University in California titled Bringing Technology to Developing Countries.

When the topic of sending used computers came up, the answer was almost always the same: The cost of shipping, repairing and maintaining these older systems is considerably more expensive and does not tend to yield useful results compared with acquiring new equipment via discount pricing or through direct corporate or institutional donation.

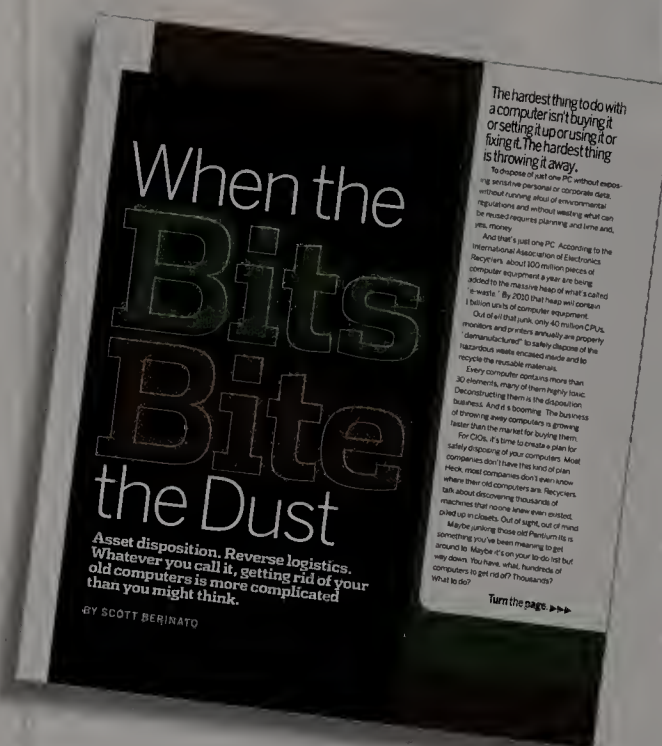
This is a challenging problem. But I would agree that perhaps some refurbished systems of this type could certainly be distributed to local charity groups, particularly where the applications would be very basic, such as word processing.

CHARLES OSTMAN

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Many community dumps have disposal options for old equipment. Most will even sort through your junk, pull out the good stuff and make sure it gets a second life someplace. It's also more cost-effective



than hiring a firm to manage the issue.

To me, disposal is as much a part of the overall plan for asset management as acquisition. Any plan that does not take into account equipment past obsolescence is shortsighted.

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Unfortunately, giving away old equipment to charities or poor countries is no solution. Giving it to a charity just pushes the disposal cost either onto them or the person to whom they sell or give it. Usable software for such equipment is unavailable and unsupported, and it typically won't run a modern OS. It really is junk, and giving it to someone is generally not doing them any favors if they value their own time.

Giving these systems to poor countries is no answer either. The first argument still applies (they eventually need disposal), and delivering such systems costs more than buying new equipment.

This is a problem with no easy answer, much like the issue of nuclear waste dis-

posal. We will have to eventually figure out a way to reclaim and reuse the hazardous materials in the obsolete systems, not search for yet another hole in which to bury them.

CURTIS GRAY

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Against Biometrics

It you never want to sleep again, consider biometrics ["The Global State of Information Security 2005," Sept. 15]. If a million people have their credit card info stolen, they can be issued new cards.

What happens when biometric data is stolen? You can't get new retinas. Imagine a brave, new world where the instant you walk out of an airport, criminals know both your nationality and your bank account balance.

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Corrections

In Sept. 1 "The Pain of Backsourcing," we incorrectly list Dane Anderson's title. He is a research director with Gartner.

In the Oct. 1 cover caption for "Simple and Successful Outsourcing," we incorrectly qualified Cinergy's reason for hiring an outsourcer. CIO Bennett Gaines hired an outsourcer for database administration, and the outsourcer helped with the data warehouse project.

What Do You Think?

Send your thoughts and feedback to letters@cio.com. Letters may be edited for length or clarity. For a link to the articles mentioned, go to www.cio.com/120105.

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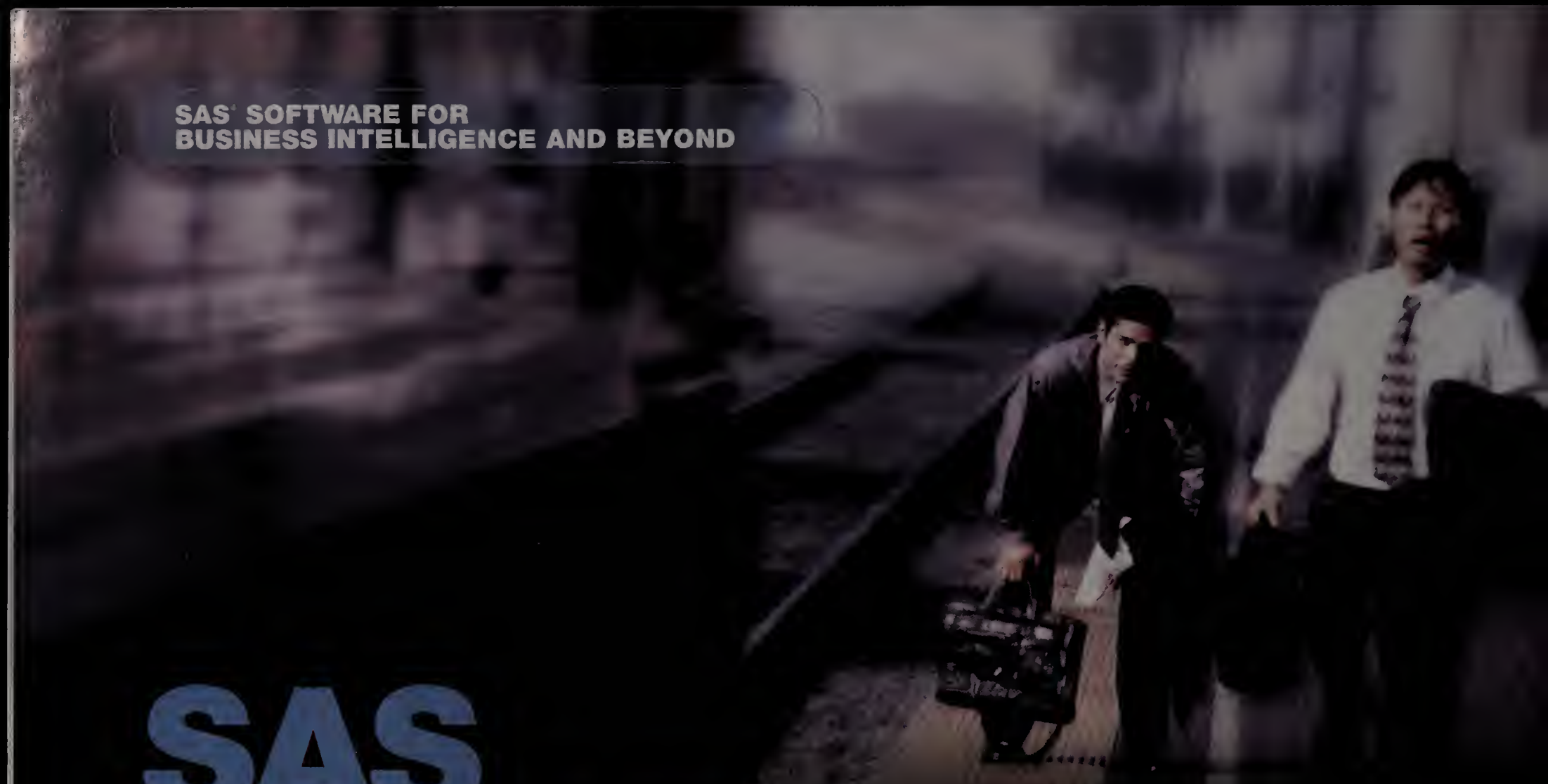
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trendlines

EDITED BY ELANA VARON

NEW * HOT * UNEXPECTED

How the Flu Migrates



COMPUTER SIMULATION Public health experts preparing for a feared avian flu pandemic are using computer models to get a glimpse of how the disease might spread if the bird virus were to start passing between people.

Based on their first models—of an outbreak in Southeast Asia—researchers affiliated with the Models of Infectious Disease Agent Study (Midas) research network have concluded that immediate treatment with vaccines and antiviral drugs, in combination with quarantines and other public health measures, could contain a pandemic.

“In the past, there hasn’t been much effort to work out predictions of how a disease might spread,” says Irene Eckstrand, scientific director at Midas. “These models have shown that if you’re going to contain the flu, you’ve got to do it really fast.”

Midas is funded by the National Institute of General Medical Sciences. Midas researchers in the United States

and Britain are working along with other U.S. government agencies and the World Health Organization to outline how best to control a nascent flu epidemic.

The flu models are based in part on models developed in England in the 1990s to deal with an outbreak of foot-and-mouth disease among livestock. To model the avian flu, researchers used a cluster of 32 processors to simulate how 500,000 individuals in Thailand move and interact during a given period of time. The models simulate where each person is likely to go each day and how many people he or she will come in contact with. The model showed that a virus would spread “like ink blots all over the place,” Eckstrand says. The data revealed that an outbreak could take off quickly and would be difficult to contain unless health-care professionals and public health officials took action immediately.

Now the researchers are using super- *Continued on Page 22*

Are the Laptop's Days Numbered?

MOBILE TECHNOLOGY

IT analysts have predicted the end of the desktop, when laptops would become the computing standard for mobile workers and cube-dwellers alike. But with advancements in converged devices (which combine wireless phone, PDA and applications such as e-mail), it's not a stretch to imagine the death of the laptop as well.

“In three years, more people are going to be using smart phone devices than laptops in some cases,” says

Richard LeVine, an expert in mobile device security with Accenture.

In the 1990s, laptops were a status symbol for executives. But CIOs report they are replacing laptops for executives and salespeople with converged devices. While vacationing, Joe Kraus, senior VP and CIO of Intelsat, talks on his Treo 600. Kraus can also send and receive e-mail, and manage his calendar without needing a hardwired connection for a laptop.

But the small devices do have limitations. “Did you ever try to type a long mes-

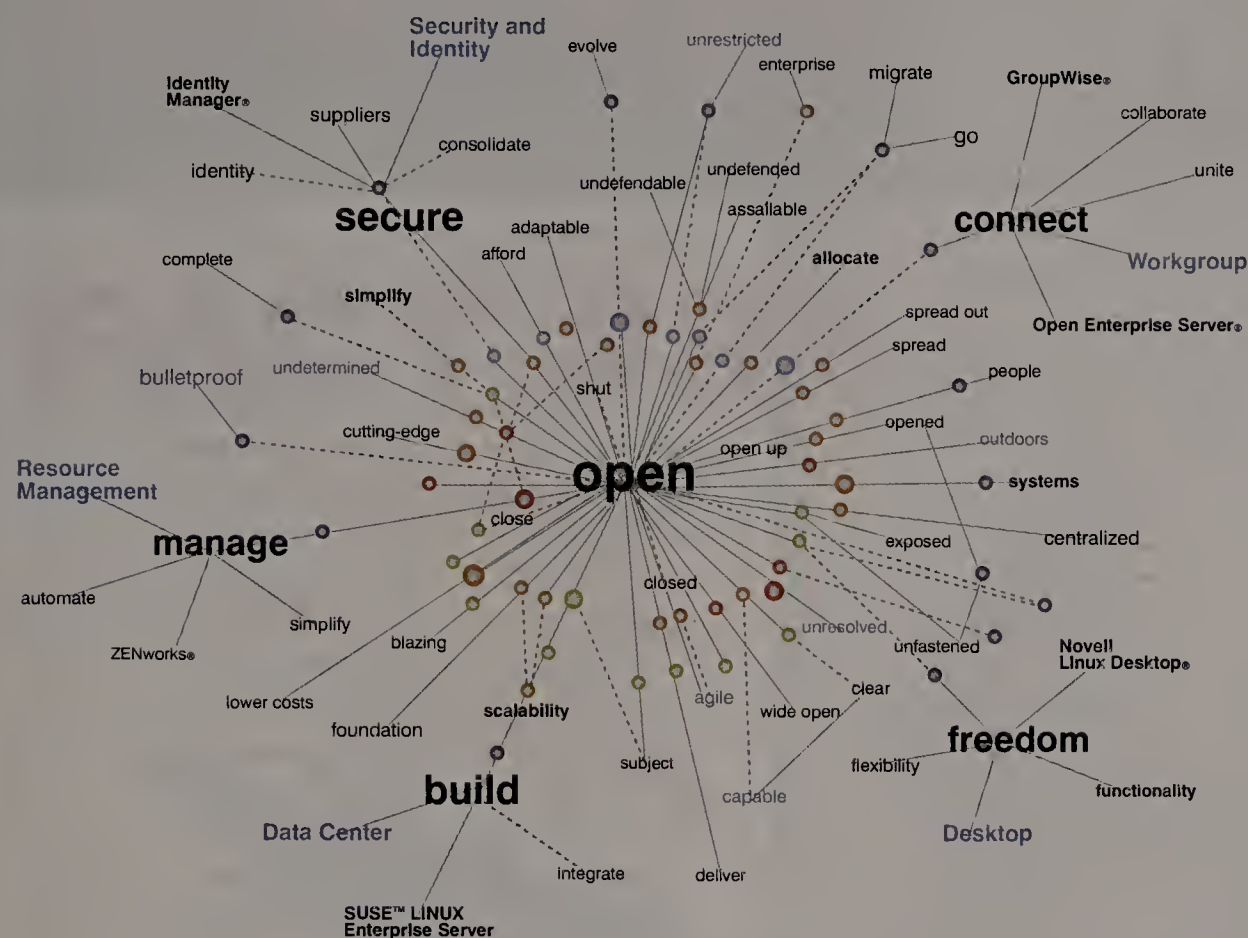
sage on one of these?!” Kraus writes in an e-mail. Many heavy-duty applications will always require a laptop's functionality.

Laptop makers say they're not worried. “Notebooks and handhelds are optimized to do different things,” says Carol Hess-Nickels, Hewlett-Packard's director of business notebook marketing.

Meanwhile, technology marches on. To learn about how to manage mobile devices, turn to “Mastering Mobile Madness,” on Page 74.

—Thomas Wailgum





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Wal-Mart's RFID Crusade

Why RFIDs Are No Good

IT and business leaders cite these obstacles to deploying RFID technology

Can't justify ROI **28%**

Cost of hardware/integration **26%**

Lack of standards **14%**

Products not optimal to RFID **9%**

Lack of customer demand **9%**

SOURCE: AMR Research

RETAIL Wal-Mart's quest to use radio frequency identification (RFID) technology to track shipments will reach a new milestone in January: The company is requiring 200 of its second-tier suppliers to begin tagging cases and pallets with the chips.

Last year, Wal-Mart pushed its 100 largest suppliers to attach RFID tags to some of their shipments. At the time, the technology was immature, standards half-baked and projects lacked ROI. (See "Tag, You're Late," www.cio.com/120105.) Not much has changed, but Wal-Mart contends—without revealing any metrics—that the experiment has been successful.

William Terrill, a senior analyst with the Burton Group, says the next 200 suppliers could benefit even more from RFIDs than the large suppliers. He says the smaller suppliers are more apt to run out of inventory in Wal-Mart's warehouses when items sell more quickly than planned, and there's no good way for them to track that now. However, the ROI remains uncertain. Terrill says tag prices are still too high to make economic sense for use with high-volume, low-value items.

But a deadline is a deadline. And, notes Kara Romanow, a research director with AMR Research, mandates such as Wal-Mart's encourage vendors to develop RFID applications—no matter the costs for everyone else.

—Thomas Wailgum

Flu Migration

Continued from Page 19

computers to create a similar model for the much larger U.S. population, says Ira Longini, a professor of biostatistics at Emory University and the leader of the Emory research group affiliated with the Midas project. The U.S. model requires supercomputers because it will simulate the movements of many more individuals than the original model, Longini says.

Public health experts agree that there will be another global flu epidemic, although they are not sure when or how severe it will be. They are also not sure whether the bird flu strain—known as H5N1—will be the origin of such a pandemic, although experts fear that the virus could mutate and start spreading among humans.

In the past, the spread of infectious disease was usually limited because people lived in smaller towns, and they didn't travel much. "Now, with planes flying between major capitals, everyone is connected to everyone else," Eckstrand says. "That's why it's potentially so important to create computer models that show how people are connected."

—Susannah Patton

Federal CIOs vs. Corporate CIOs

CIO ROLE Discussions about public-sector CIOs often revolve around how their role differs from that of their private-sector IT peers—for example, the frustrations of working within government bureaucracies. But a recent study by the Government Accountability Office found that federal CIOs have much in common with their corporate brethren.

The GAO asked 27 federal

and 20 corporate CIOs (from companies including Wal-Mart, PepsiCo and Lands' End) about their responsibilities with regard to a dozen IT functions. Nearly every respondent said he is responsible for information security, managing IT investments, managing staff, and acquiring, developing and integrating systems, though some share these duties with other business leaders.

CIOs in both groups were similarly less likely to be in charge of privacy, records management, statistical policy, or information dissemination and disclosure.

There were, however, two notable differences. Every federal CIO has responsibility for enterprise architecture, but only 15 out of 20 corporate CIOs said they do—a sign, according to David Powner, GAO director of IT

management issues, that enterprise architecture is still maturing as a planning activity and that some corporate CIOs are driven largely by shorter-term tactical plans. In addition, all 27 federal CIOs—but only 17 of 20 corporate CIOs—said they are responsible for IT strategic planning. Powner says that at many of the companies surveyed, technology was part of a broader business plan. —Elana Varon

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Battle of the DVD Distributors

E-COMMERCE The coming year could witness the decisive battle for market share in the online DVD rental business, with IT providing the competitive advantage.

In one corner, with 3.5 million customers and 36 distribution centers: Netflix. In the other, with 1 million online subscribers and 5,700 retail stores: Blockbuster.

For Netflix, a crucial weapon for maintaining its market share (estimated at two-thirds of online DVD rentals) is new, homegrown software that improves upon the Oracle database the company uses to automate the DVD distribution process.

The software consults the database to match customer requests with the movies in inventory. Based on algorithms devised to maximize delivery time by mail, the application decides which distribution center will fulfill each movie. The program then generates a "pull list" for workers at each center to fulfill the orders and ship them out. "The whole idea of this system is to get discs in and out faster and to lower cost," says Tom Dillon, Netflix vice president and COO.

Blockbuster is attacking with similar technology to orchestrate DVD delivery by mail from the chain's stores. Central to the Blockbuster strategy is the integration of 28 systems into one that feeds data about online orders to retail locations quickly. Shane Evangelist, senior vice president and general manager for Blockbuster Online, says he expects the rollout of this system to be completed by the end of 2006. "The hard part was getting the data to the stores," he says.

Critics are skeptical Blockbuster can win. Tom Adams, president of Adams Media Research, notes that inventory at retail stores is small in comparison to inventory at distribution centers. Therefore, when one Blockbuster store doesn't have a video in stock, the system will pull the video from another store, which could prolong the delivery time. "Even with the best technology on Earth, it's difficult to play catch-up," Adams says. —Matt Villano

Don't Be a Hero

MANAGEMENT REPORT Face it, you don't know everything. And your first step as a leader should be to admit it and then surround yourself with people who will know what to do when you, inevitably, don't.

That's advice from André Martin, an enterprise associate at the Center for Creative Leadership (CCL), who studies what it takes to be an effective leader. "The age of the hero leader is ending," says Martin. "The whole idea that a leader can solve and manage and get through [today's] challenges by him or herself is no longer the case."

A recent CCL study found that **decisiveness and a willingness to "do whatever it takes" to lead are no longer enough to succeed.** Skills such as building relationships and the ability to manage change have risen in importance as the challenges companies face become more complex.

CCL surveyed 128 senior and middle managers. Sixty percent said they face challenges that go beyond their individual capabilities. As a result, the study concludes, **managers must view their role as someone who facilitates the work of their employees.** They can do this by providing their staff with the necessary resources and by making it possible for them to work collaboratively with people in different parts of the organization as they adapt to changing business needs.

The Changing Nature of Leadership

What managers said about their role

- 84%** Said the definition of effective leadership has changed in the past five years.
- 60%** Of leaders face challenges that go beyond their individual capabilities.
- 58%** Said interdependent work is the foundation of effective leadership.

SOURCE: Center for Creative Leadership

The new findings contrast with a 2002 survey by CCL, which ranked resourcefulness and straightforwardness among the skills that were most important for leaders to possess. Today, these skills have been supplanted in importance by the ability to build relationships and to manage change. Consistent with these responses, 84 percent of those surveyed said the definition of leadership has changed in the past five years.

Martin says **new leadership challenges stem from a more competitive business climate and abrupt changes in the way companies do business.**

"Technological change, new ideas—really any societal improvement—used to take decades to happen," says Martin. "Now, we're finding those changes can happen over a single 24-hour period."

—C.G. Lynch

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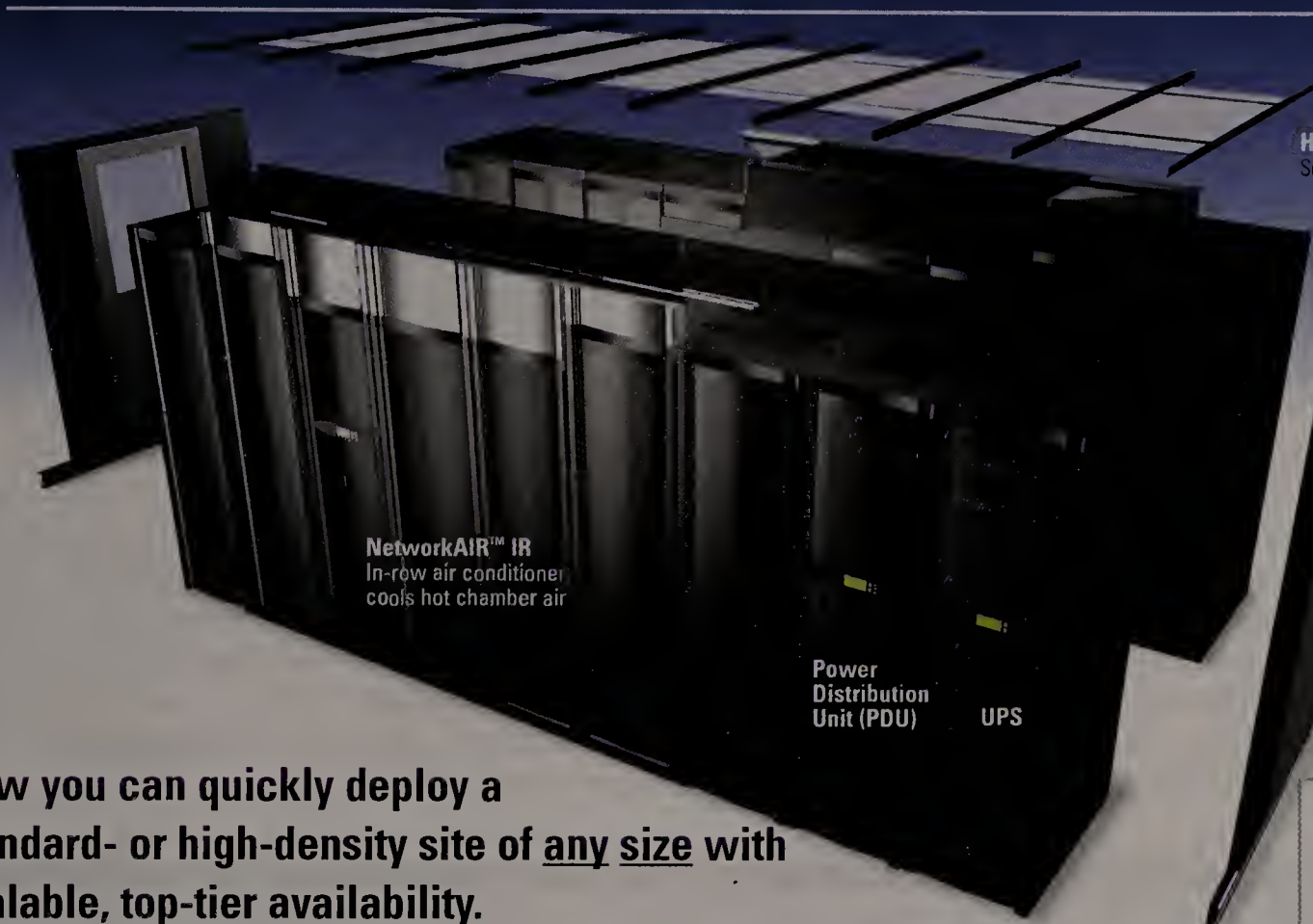
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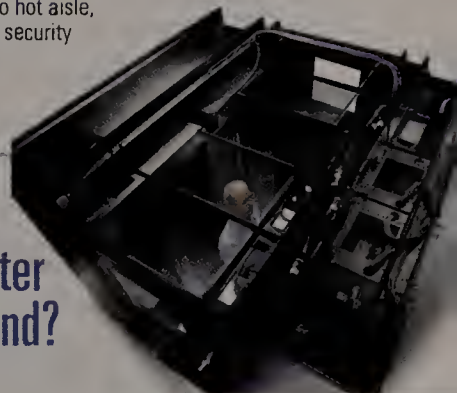
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ISXT240MD11R	11	up to 5kW	\$249,999*	\$7,999**
ISXT280MD40R	40	up to 5kW	\$699,999*	\$21,999**
ISXT280MD100R	100	up to 5kW	\$1,649,999*	\$50,999**

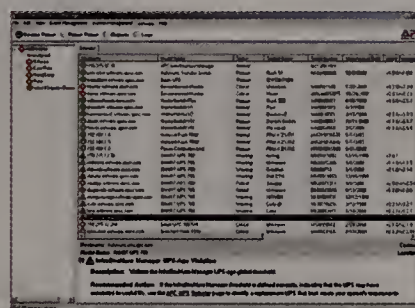
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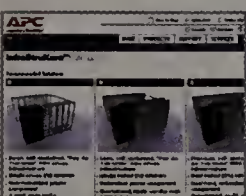


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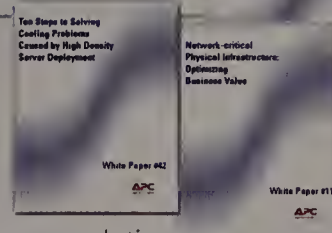


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The GREENING of a CIO

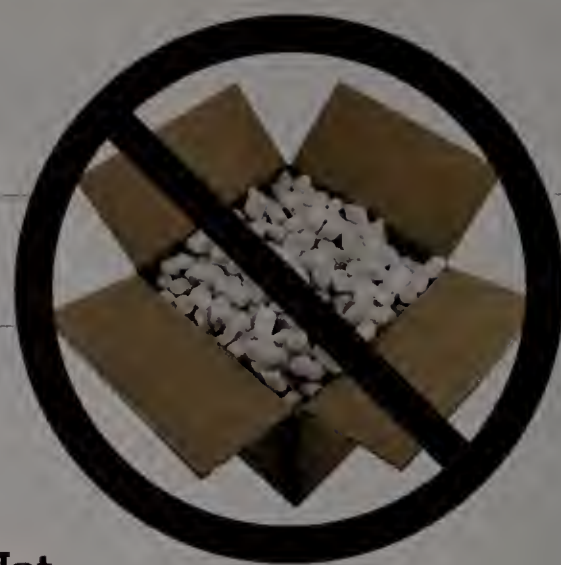
E-WASTE As VP and CIO at United Technologies Corp. (UTC), John Doucette thought he had heard every complaint. But getting blamed for trash, as he was during a PC refresh four years ago, was something new. "At every business review, the guy who managed waste would say that he was over target," Doucette remembers, "and he'd blame me." Hardly surprising, considering that every computer arrives in a box, wrapped in plastic or packed with styrofoam peanuts, among other packaging. "You don't realize how much trash is left behind," he says.

So Doucette vowed that the next technology refresh would be boxless. He's in the process of deploying 33,000 computers at 700 sites, and three-quarters of them will be shipped box-free. He'll use the rest of the boxes to send old computers back to his vendor, CSC.

Here's how the process works: Computer maker Dell ships the computers to a middleman, who removes and reuses the packaging. The middleman installs about 60 percent of the hard drive's image on the UTC systems and puts them in specially designed

crates, then ships them to UTC. UTC completes the software installation.

The process isn't waste-free yet. Keyboards and mice are too delicate to be shipped in their birthday suits. But still, Doucette's efforts have saved significant time, money and resources. (CSC has incorporated the savings into UTC's contract.) "Smaller and less is better from everyone's perspective. From a waste standpoint, a cost standpoint, with the cost of raw materials going up, our focus is on making this process less wasteful." —Scott Berinato



Waste Not

By eliminating packaging from the PCs it buys, United Technologies eliminates **132,000** pounds of waste.

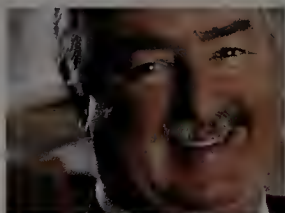
SOURCE: UTC, Southern Illinois University

What It Takes to Get Promoted

ON THE MOVE

CIOs who want to move up the ladder into another senior executive role within their company need to be recognized as businesspeople, not technologists.

According to Rich Brennen, global leader in the CIO practice of executive recruiting firm Spencer Stuart, a new assignment depends on whether the CIO is viewed as a contributor to the business—that is, participating in strategic business decisions, speaking up during the CEO's staff meetings, and generally being recognized by the CEO and his executive peers as an equal partner. Based on the credentials of CIOs who have been given new titles or responsibilities recently, an IT executive must also oversee at least one major technology initiative that has a positive



JOHN DEANE



RAJ DATT

impact on the business.

Before **John Deane** was promoted last spring from executive VP and CIO at Wendy's to executive VP of the fast-food chain's America operations, he oversaw store budgeting, store automation and electronic payment initiatives. By going paperless, Wendy's says it saved \$1.7 million between February 2004 and February 2005.

Gerald Glusic's promotion at copper producer Phelps Dodge recognizes the improvements he's made to business processes as well as his success with the company's technology standardization and data warehouse implementation. Glusic, formerly the VP and CIO, became VP of global supply chain management and information services in October.

Also in October, Walgreen's **Trent Taylor** was promoted from senior VP and CIO to executive VP and CIO. CEO David Bernauer says Taylor brings "intelligence, creativity and a calm manner" to the job. Bernauer credits Taylor with building a talented staff that helps the company maintain its position as a retail IT leader.

Meanwhile, **Raj Datt**, Panasonic Automotive Systems' CIO, became a VP of the manufacturer. Datt transformed the company's IT department. He led the consolidation of the company's e-mail systems, implemented a new ERP system and staffed a 24/7 help desk. Datt also introduced collaboration tools such as instant messaging and Six Sigma processes within the IT department.

—Meridith Levinson

On the Web

Read Meridith Levinson's **MOVERS AND SHAKERS** blog for the latest moves. Find it at www.cio.com/blogs.

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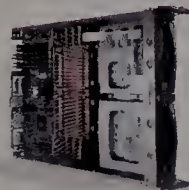
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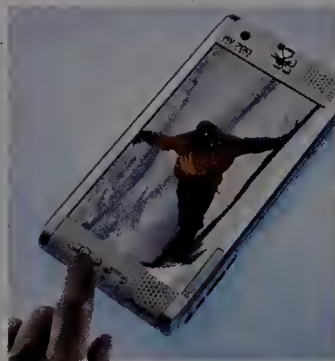
The athlete on your list might like the **Adidas 1**. A microprocessor in the shoe's arch analyzes a runner's speed and the surface she's running on and adjusts the cushioning inside through a motor-driven cable system in the heel to provide the ideal amount of shock absorption. In other words, the company claims the shoe "knows the difference between gravel and dirt." Watch it work at www.adidas.com. **\$250**

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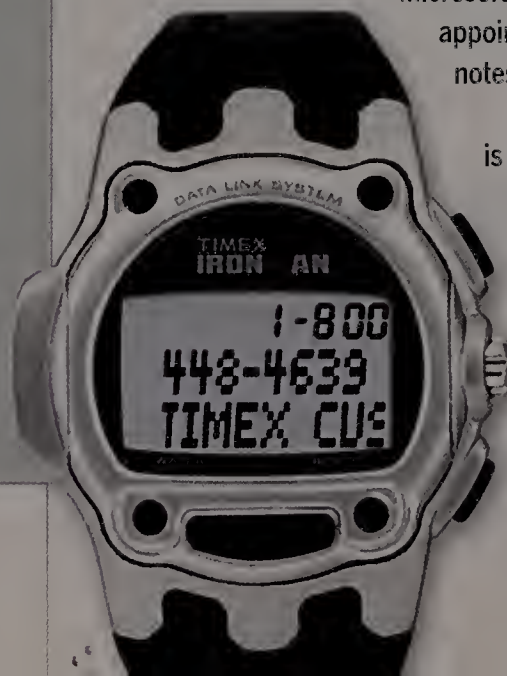
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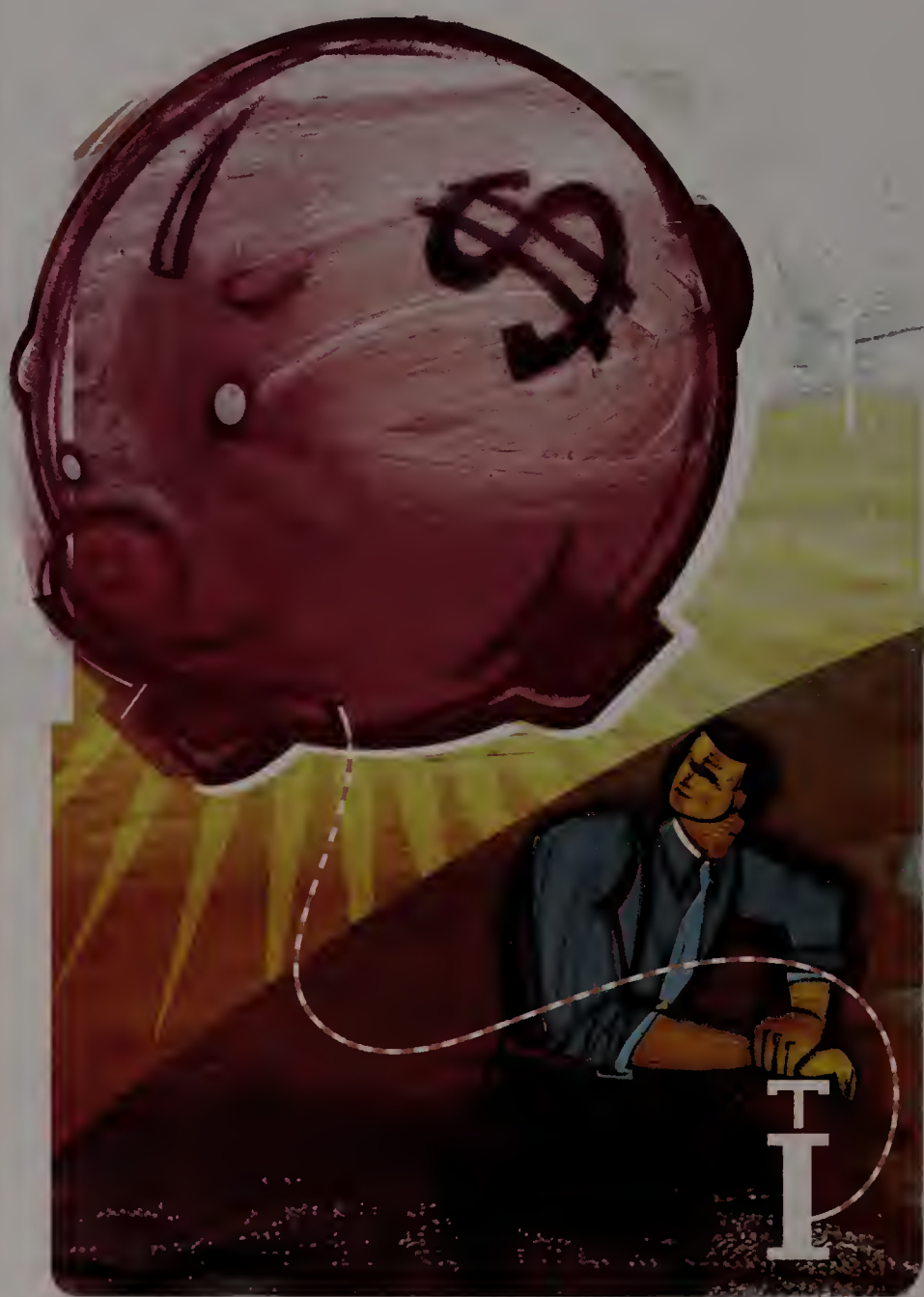
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How to Do More With the IT You've Got

IT's capacity for growth and change lies within its architecture



It's futile for CIOs to try to explain why IT projects cost so much and take so long. No one is interested in hearing about the cumulative impact of having to chase after ever-fickle, self-interested business partners with a series of uncoordinated, short-term development activities built on the technology du jour. When IT leaders do this rant, they sound like teenagers who aren't taking responsibility for wrecking the car. It's up to CIOs to push out the dents in their architectures and get their (or really their company's) money's worth.

This article is the third in a series examining promising concepts to improve IT-business alignment. Last time, we equipped Ernest, a real CIO at a large company, with two mechanisms for managing IT demand: corporate strategy-making and IT value accountability. But improving demand management is only part of the answer to Ernest's challenges. His IT department is stymied, day in and day out, by an expensive and inflexible architecture. Unless he addresses his supply of IT—that is, the capacity of IT to effect change within his company—Ernest will be unable to make progress toward alignment.

Where Has All the Money Gone?

As in many IT organizations, Ernest's capacity for change is severely limited because 70 percent of every IT dollar goes to nondiscretionary expenses (in support of the existing applications, infrastructure and user base) rather than new capabilities. There are many ways to reduce these "lights on" costs of IT, such as vendor contract renegotiation, systems and process standardization, technology retirement, strategic sourcing, automated tools, and tiered pricing and service levels. Unfortunately for Ernest—like so many of you—he has no idea what

ILLUSTRATION BY GREG GRIGORIOU

A black and white photograph of a man in a dark suit and tie, looking out of a window at night. The window shows a view of a city skyline with lights reflecting on the water. The man is looking towards the left side of the frame.

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is driving his costs. His monthly financial reports, with costs broken down by General Ledger account number, are useless. The byzantine after-the-fact cost allocations result in more questions than insights.

Effective cost reduction programs require an understanding of where Pareto's Law is located in the numbers—for example, which 20 percent of the applications, technologies, services and customers are driving 80 percent of IT costs? Ernest has heard of activity-based costing (ABC), in which all IT charges are allocated to categories on an hour-by-hour and invoice-by-invoice basis. He has also heard nightmare implementation stories about ABC, such as the CIO who invested \$10 million over two years to implement an ABC system that is dying on the vine due to the impossibility of managing to the level of process and data complexity required by the system.

CIOs' capacity for change is limited because 70% of every IT dollar goes to nondiscretionary expenses.

Instead, Ernest needs to explore activity-based *budgeting*—calculating the actual costs of last year's products, services and consumption, setting rates for IT services to match, and basing next year's IT budget on that. This is a reasonable first step (and possibly the only one he will need to take) to understanding IT cost drivers. With this level of insight, CIOs can not only identify cost reduction opportunities but also influence future consumption, by having conversations with the business before the budgeting process begins. CIOs can show business managers what products and services they consume—at what level and at what cost—and brainstorm approaches to lower their consumption, reduce their rates or both. By reducing the "lights on" costs, activity-based budgeting frees up the supply of IT.

The New IT Staffers: Architecture Students

Another way to increase IT's capacity for change is to improve its architectural flexibility. CIOs can implement technology development approaches that promote integration and reuse. In Ernest's case, this will require a big attitude change from his IT group. The company's legacy systems are a mess, but his team needs to make the most of what it has, because there will never be enough time or money to do it right. The old saying, "Systems are like pancakes—throw the first one out," may be true, but it's impractical. Some of Ernest's "legacy" is only two or three years old because his predecessor, when chartered to replace existing systems, faced the familiar constraints—lack of time, people and knowledge—and developed standalone inflexible systems. By failing to consider integration and reuse,

Reader Q&A

Q: If CIOs are to improve architectural flexibility, isn't it really business executives rather than the IT group who need a big attitude change? Left to their own devices, most CIOs would install reusable, scalable systems that integrate with an enterprise architecture, but they are undermined by businesspeople who cut deals with vendors and refuse to consider the needs of the whole.

A: It's convenient to lay this one on the shoulders of the business executives, but that's a cop out. In most organizations, IT defines the alternatives for systems, and if the "fast and dirty" alternative is not on the table, the business counterparts wouldn't know the difference. It's usually disagreements within IT about the best approach that become visible and that the business can latch onto. Some of these disagreements are valid—for instance, it's unreasonable to decide to be architecturally flexible on the next project without doing the necessary spadework beforehand, such as understanding the core business processes and strategies, identifying key services and data, selecting and implementing tools, and running internal pilot projects to test concepts. Again, the ability to carve out funding for this R&D is a CIO's responsibility. A best practice is to create R&D funding by reducing the "lights on" cost of IT.

Q: Activity-based costing (ABC) seems like the ideal for IT, because people pay for what they get. What causes ABC initiatives to fail?

A: Imagine having to post every item purchased or hour paid not only to a general ledger account code and department, but

also to a customer, product, project and so on. Minor accounting decisions can have huge implications for data management and can even cause an ABC sys-

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tem to melt down due to lack of compliance, traceability or accuracy. With ABC, perfect oftentimes becomes the enemy of the good. With activity-based budgeting (ABB), it's easier to maintain the big picture and not get lost in the data. Remember that the big picture is to understand what 20 percent of projects, services, systems, customers, processes and assets are driving 80 percent of IT costs.

Susan Cramm is founder and president of Valuedance, an executive coaching firm in San Clemente, Calif. You can e-mail feedback to susan@valuedance.com.



PHOTO BY ASA MATHAT

The old saying, "Systems are like pancakes—throw the first one out," may be true, but it's impractical.

that CIO re-created the past that the company was so desperately trying to leave behind.

Ernest needs to clean up the existing infrastructure and leverage what strengths it has as he delivers new functionality. It so happens that Ernest is a former enterprise architect—a background that will serve him well. He understands implicitly that the future of IT consists of layered architectures, including separation and modularization of business logic, encapsulation of data structures and sources, and utilization of standard services. It's time for him to dust off the plans that, in his former architectural role, he could never get anyone to adopt. Ernest can integrate his company's disparate systems by using messaging and service-oriented architectures.

Even while upgrading his architecture, Ernest can deliver new IT capabilities. He can identify the intersections between his current architecture, his likely IT projects and business/IT strategy (to learn how to incorporate business strategy into IT maxims, see "Your

To-Do List for Managing Demand" at www.cio.com/110105). For example, Ernest can create a centralized view of his company's customers by utilizing messaging with his existing databases as he builds out call center and warehouse management capabilities. He can also enhance the company's supply chain by knitting together existing applications with an integration layer. Finally, he can use any new development effort as an occasion to start building a service library. (While it's true that dramatic development cycle time and cost improvements can only be realized with a fully featured service library, this approach will give Ernest a way to deliver new capabilities without the unrealistic burden of redeveloping existing functionality.)

Although Ernest now has the right tools for IT-business alignment, he is just one man among many. The road to alignment is perilous, and he can't go it alone. In the next and final installment on alignment, I will emphasize the importance of leadership from all levels of the organization in enhancing capacity and flexibility. **CIO**

Everything on Alignment

To read Susan Cramm's full series on alignment, go to www.cio.com/executivecoach.

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The future of the U.S. information technology industry—and thus the competitiveness of the nation—is caught in a trap of misperception. Since the burst of the dotcom bubble in 2000, young people have avoided careers in information technology. The number of computer science majors at U.S. universities has plummeted. Worse, the dwindling pool of people who enter the field is losing diversity even more rapidly, a tragedy for a field that already had one of the lowest participation rates by women, African-Americans and Hispanics. Now more than ever, the field attracts people who are fascinated with programming and technology for their own sakes—to put it harshly, the true geeks. High school students who do not devote all their waking minutes to computers and programming feel they are unfit for careers in computer science.

Yet the demand for people with computer science skills is at an all-time high. The latest figures from the U.S. Department of Labor show that the number of computing-related jobs has surpassed the previous peak in 2000. What is more, computing-related jobs are no longer an isolated component of American industries; IT underpins every function of the business community—market research, product design, finance, strategic planning, environmental issues—every aspect of doing and leading. That means these jobs are not only vital but fun. They require people who have strong technical knowledge but who also can work and contribute in a much broader realm. A recent *New York Times* article dubbed this kind of IT professional “the renaissance geek.” The leaders of Microsoft, Google and other companies have made their point clear: Give us more well-trained, well-rounded computer scientists!

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**MOBILE
TECHNOLOGY**

The reality is that a career in IT is dynamic and in demand. Yet the myth of a narrow, boring and uncertain work life persists. Unless this misperception is corrected, we will continue to lose talent, and the United States will become a technology backwater. Companies will shift technical and innovative work offshore. Our standard of living will decline because the driving force behind today's economies is innovation, which, in turn, requires a workforce that is highly educated in science and technology.

So what are we to do? Addressing this issue will require significant changes in our culture. I take heart in past educational campaigns that have made a difference, such as the antismoking efforts of the last 30 years. But the answer requires more than public relations. Industry, government and academia all have a duty to cultivate and celebrate the dynamic nature of today's computing careers. As a professor of computer science and dean of an engineering school, I believe that substantial responsibility for the current situation lies in the way we teach engineering and applied science. We can do so much more to attract and engage young people from kindergarten through graduate school.

At all levels, schools need to make computing attractive to ambitious students who have a fondness for technology but also want to fold in other skills and interests. These are the students who are going to be leaders and make a difference in the world, and they include women and minorities and the full cross-section of society.

The way we currently teach computer science in high school and universities does not meet this goal. For the most part, the introduction to computers in K-12 is typing, followed by making webpages. In high school, students can learn program-

Unless we correct the misperception of IT as a narrow and boring field, we will continue to lose jobs abroad.

ming, but the focus is narrow, and students who sail through these classes are not necessarily the best positioned for success in computer science careers. In fact, college-level teachers sometimes use a completely unfamiliar programming language in an effort to dispel the bad habits students picked up during their many hours before the keyboard. And while programming is an important tool in computer science, it does not reflect the broad range of ideas and concepts that make up our field, including computer architecture, theory and systems.

The preparation we need starts in grades K-12, when many students turn away from math and science. A key problem is that children receive very little exposure to real projects and careers in engineering and applied science. I would like to see more open houses, summer camps, weekend events that partner schools with businesses and universities. In British

Columbia, Canada, a program called Scientists & Innovators in the Schools trains scientist volunteers and pairs them with schools that want exposure to their fields. Summer programs at Princeton put teachers into labs with high-level scientists and send them back with tools to conduct hands-on projects in their classrooms.

At the college level, I propose several tactics:

- **Make computer science courses a requirement** for more undergraduates. During the dotcom boom, any such proposal would have panicked computer science departments, but for the first time in two decades these departments have excess capacity. In addition, many disciplines with large numbers of undergraduate majors (biology, psychology, history) have discovered the impact of computing and are likely to be enthusiastic about having their students take a computer science course, especially if it is tailored to their needs.

- **Make sure students are excited by their first computing course.** We must assign them the best instructors and creative course content and then establish explicit bridges so students who enjoy a "computer literacy" course can make the transition to advanced courses and a computer science major they had never previously considered. At Princeton, a new integrated course that combines computer science, biology, physics and chemistry has attracted several women to major in computer science.

- **Build connections to other disciplines** with double majors (computer science plus biology, psychology, business, policy, interactive arts) and multidisciplinary projects.

- **Create partnerships and internships** with industry to show students what real-world jobs are like, and create partnerships with K-12 teachers to give young students a more dynamic view of computing fields.

In all these efforts, academic institutions must provide a supportive environment for women and minorities. Underrepresented groups, as well as those with outside interests such as the arts, public policy or business, need more encouragement to stay in a computer science program because all the signals send the message that they don't belong. For example, a woman doing well academically may leave because she doesn't see herself as having the same level of interest as the male students who spend their spare time programming computer games or reading technical blogs. There is a lot that can be done to counteract this effect—providing role models with lots of outside interests and faculty speaking explicitly of the value of broad interests in their classes. But none of it will happen without a concerted effort.

At the same time, we must hire more women faculty in computer science. Women serve as important role models but also tend to engage in interdisciplinary research and invest their energy in innovative teaching. At Princeton, we are putting into place a strategic vision that makes diversity

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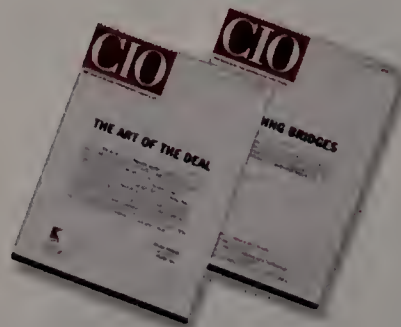
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a top priority and emphasizes the connections between engineering and the broader university, including liberal arts. In addition we have set a goal of convincing 90 percent of all bachelor of arts students to take at least one engineering course, many of which have a computing component.

None of these efforts can move forward without the support of government and industry. The National Science Foundation took an important step forward with the creation of its Broadening Participation in Computing program, which was launched this year. The NSF can help even more by increasing basic funding for computer science research. It and other agencies could create preferential scholarships and loans for students majoring in computer science. Through awards and public relations, government agencies can do a lot to drive a shift in public perception of computing careers.

But when it comes to marketing, American industry is second to none. I would like to see a consortium of U.S. companies devote a fraction of their advertising and marketing budgets to creating a realistic (and hence positive) image of careers in computing. If the auto industry can promote the use of seat belts, and distillers can fight drinking and driving, then companies with an interest in computer science ought to be able to market their own field to young people. Yet like academia, the IT industry has some cultural issues to improve. I know from speaking to students and young alumni, for

example, that many women and minorities view the interview process at some technology companies as adversarial and unwelcoming. The industry also can wield considerable influence if it engages with secondary as well as higher ed schools to improve computing education.

It will take time to see the effects of many of these changes, so we have to make a long-term commitment. And it is critical that correcting a misperception does not create a new one that overstates our case. There is no question that a degree in computer science is not a magic bullet for financial success. Indeed, the days of the dotcom twentysomethings who became instant millionaires are over. A successful long-term career in computing requires the same effort and skill that are necessary in other fields: developing strong people and communication skills, willingness and ability to learn new technologies, understanding what makes businesses successful and adapting to change. Still, the opportunity in computer science for creative work that makes a difference equals or surpasses that in any other field I can imagine. **CIO**

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Serenity Found

Here's how to inoculate yourself against stress and burnout
(once you understand the difference)



We all know that CIO stands for “Career Is Over.” The wag who coined that acronym was undoubtedly referring to the burnout factor that comes with the job and the consequent short tenure of the average CIO. I’m not talking about the difficulties inherent in systems design and development or data center operations but, rather, the misery of working unnoticed and unappreciated until something breaks down. That’s when the CIO must explain to senior executives that their company is being crippled by aging systems, why their equipment must be retrofitted and/or replaced, and why spending money on IT is a fact of life in the 21st century. And even if the executives can hear and understand the bad news, the CIO is still vulnerable to being axed when the problem can’t be solved fast enough or the technology can’t be aligned with corporate goals within an arbitrarily imposed budget.

That’s your world, and given its pressure-packed nature, you will likely suffer some considerable stress or experience burnout at some point in time. Thus, it is of paramount importance that you know the difference between the two.

Pouring Gasoline on a Fire

Everyone knows that working too hard is stressful and can lead to burnout. But CIOs in senior management positions may also suffer burnout if they’re doing nothing more than watching the divisions they built run themselves! I call this state of being bored witless “supernova burnout.” Strange as it sounds to someone working to exhaustion, doing nothing—at least nothing intellectually challenging—can be as disruptive to your mental health as working 14 hours a day like a rented mule.

ILLUSTRATION BY GARY SAWYER



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If you don't know the difference between stress and burnout, the danger is that you may end up pouring gasoline on the fire. For example, interventions that are "just what the doctor ordered" for stress (rest and relaxation) can exacerbate feelings of burnout. The CIO who is suffering supernova burnout, a term I coined to describe those who've achieved success—say, by playing a critical role in the leadership of a company—needs new challenges. Sending him to a resort for three weeks of downtime is robbing him of what he needs: a healthy challenge. It is likely to drive him mad. On the other hand, the rented mule who's working 14-hour days and has no control over what he does (he's rented, you see) needs some R&R.

to do it. On the other hand, I know how to box, so I'll happily climb into a ring with most anyone. For most people, that would be stressful, but I perceive myself to be in control when I box so I experience no stress when sparring.

The Etiology of Burnout

CIOs are very vulnerable to stress. The systems they work with are prey to hackers, viruses and programming bugs and can crash for myriad reasons, all of which contribute to their lack of perceived control. Corporate officers above the CIO often don't understand the systems the CIO controls, so they may do things out of ignorance that do major damage. This

CIOs may also suffer burnout if they're doing nothing more than watching the divisions they built run themselves! I call this state of being bored witless "supernova burnout."

Good Stress and Bad

Stress is a word that is constantly misused. In engineering, stress refers to a force applied to a structure, a bridge or a material such as concrete or bone that causes change (strain, cracking or "failure") in the integrity of the material. This would suggest that psychological stress is a force lurking outside us, like fire, something that would have a uniformly adverse effect upon anyone who comes in contact with it.

But stress does not lurk outside. In fact, psychological stress exists almost entirely in the eye of the beholder. People will experience stress only if they view something as posing a threat of harming them in a physical or psychological way. I, for one, experience threat (and stress) at the idea of standing atop an icy mountaintop on two slats of fiberglass and contemplating what I'm going to have to do to get down to the bottom. Of course, those of you who enjoy skiing find this exciting. And there you have another wrinkle in the stress nomenclature. Psychologists call your elation at being atop a mountain contemplating your rapid descent eustress, the "good" stress that people derive from confronting and overcoming challenges. The way I help clients understand stress is to quote a great thinker, Epictetus, who did his thinking in 40 B.C.: "Men are disturbed not by things but by the views they take of them."

What Epictetus didn't know was that there is one factor that regulates how much or how little our views of things are likely to result in feelings of stress. Psychologists call it "perceived control." It's perceived, rather than actual, because you don't have to be "in control," you just have to believe you are in order to have it work wonders.

Let's go back to the mountain. I view skiing as stressful because I have no idea how

lack of control causes countless symptoms (from hair loss to impotence), but the most common are irritability, poor concentration and a general sense of malaise.

Christina Maslach, a pioneer researcher on burnout, claims that burnout derives from a disconnect between what people are and what they do. To her, there is a spiritual underpinning to burnout: It represents a deterioration in values, dignity, spirit and will—what she calls "an erosion of the human soul"—that occurs when our careers cause us to feel chronically exhausted, cynical, detached from work and increasingly ineffective.

Unlike the person experiencing stress, the person suffering burnout is not anxious but, rather, detached—from work and from his colleagues. You're suffering burnout when you're "going through the motions." My burned-out clients, all C-level executives, tell me, "I'm in it only for the money." The other signs of burnout are watching the clock, being passive-aggressive to higher authorities, or fantasizing an escape from work that involves seeing the company suffer when you're gone. ("We never appreciated Jones's contribution until....")

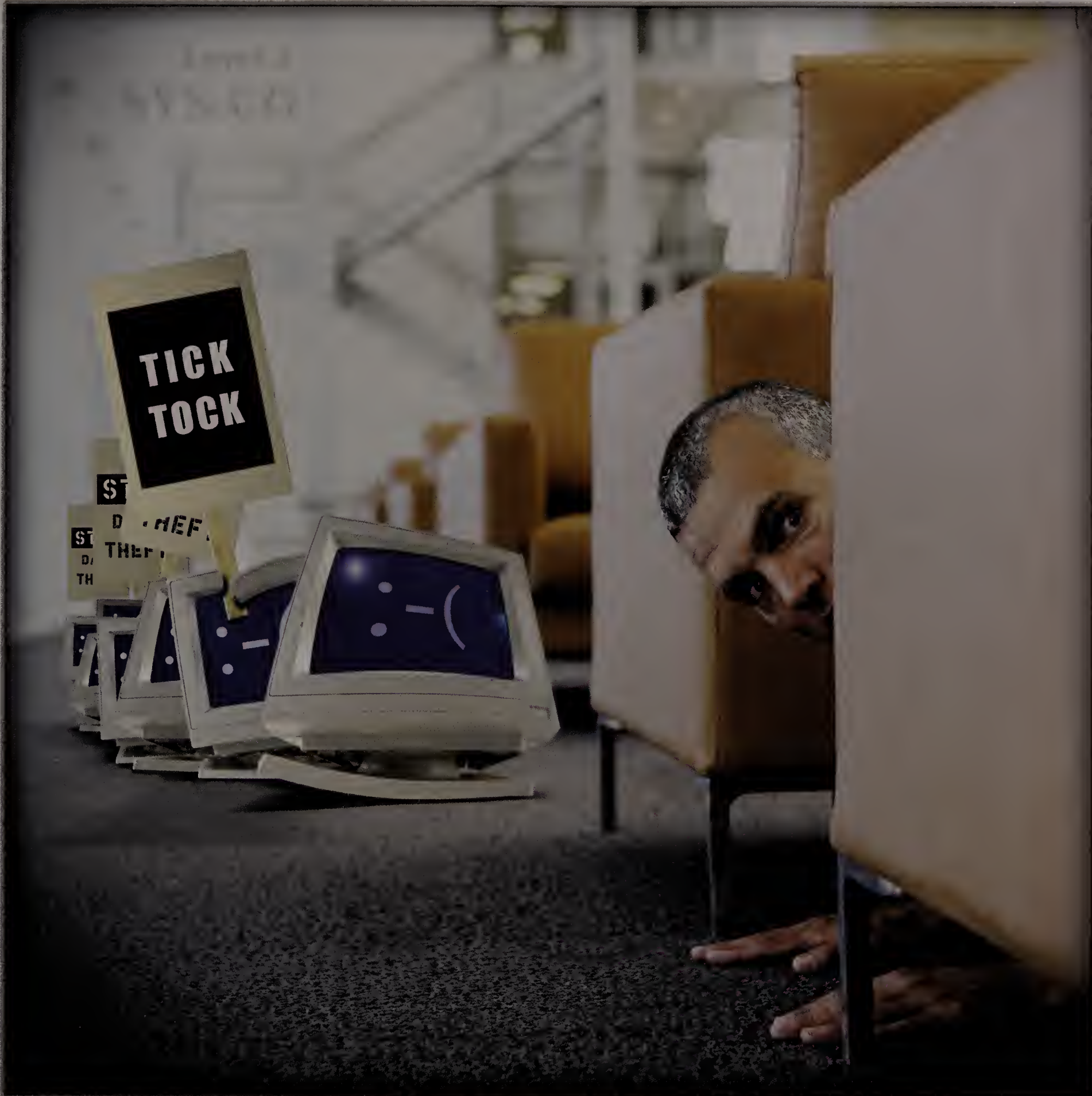
The CIO is a prime candidate for the generic form of burnout not because he has protracted emotional demands but because the efforts he expends are not fully valued or appreciated. In effect, the CIO can grow alienated because his contributions go unnoticed. When you have to tell your superiors what those contributions are, the resultant praise (if it comes) loses much

of its value. Praise is a funny thing; when you solicit it, it's worthless. The CIO who has to explain what he's done is often in the position of bringing pearls to swine and wondering, "Do I belong here?" That's disheartening, demoralizing and a precursor to burnout.

How to Stay Stress-Free

Have you ever experienced stress or burnout? How did you handle it? Share your experience and tips at www.cio.com/120105.

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The other reason CIOs are vulnerable to burnout is that because the corporation is now completely dependent on the technology the CIO provides, he must oversee ever more extensive and complex networks and systems. The responsibility for developing a company's IT architecture and integrating new technologies is the CIO's, yet many companies claim to want their CIO to also be a strategic thinker involved in business plans and projections. Far too often this message is not consistent: Although they're put on corporate leadership teams and told to maintain a strong position there, in the event of a technological snafu, CIOs are returned to their technical role and expected to serve a support function.

Unlike someone experiencing stress, the person suffering burnout is not anxious but, rather, detached from work. You're suffering burnout when you're "going through the motions."

The problem boils down to the fact that a CIO may actually do four jobs: strategic planning, IT planning (such as creating architecture), IT oversight and supervision of IT operations. It's an ambiguous life and one fraught with anxiety (the dominant symptom of not working with clear expectations). Thus, I would wager that most CIOs suffer burnout more than stress. Although the workload is enormous (stressful), they never know when those they are trying to please will be pleased (leading to burnout).

Doctor's Orders

To inoculate against CIO burnout: No CIO can suffer burnout if he awakes in the morning to clear and achievable goals. What CIOs must do is break the job down into components and appoint subheads for each department that reports to them. This does several things to remove ambiguity—and it makes the value of the work more obvious. In bureaucracies, naming and defining connotes importance. By creating a CTO who reports to you and oversees IT planning, you explain what you are overseeing. Similarly, having a head of IT operations who is there so you're not pulled from a board meeting the next time a snafu occurs lets the world know you're more than a technician. You can say, "Fenton's my guy for system breakdowns." The other thing to do is advertise how you cannot do things without departments. If you see a demand coming—that is, if a new, potential stressor is about to be put on your plate ("Say, Jacobs, my buddy at Systek is outsourcing his IT jobs offshore. Can you look into that?"), be certain to say, "We'll need a department of 'Offshore Employment' to do that given the legal, economic and governmental issues involved. If you tell Kane in HR, I'd be glad to set that up."

To treat CIO stress: From what I know of CIOs, those currently experiencing stress most likely believe they should have more control than they actually do. This belief often comes from self-imposed pressure to legitimize their role. Many CIOs believe that if they are not Superman—if they cannot handle whatever they're asked to do—they will somehow jeopardize the status of their department. Poppycrack. Lou Gerstner parachuted into IBM and gained points by saying, "Hey, I'm a brilliant manager but I don't know about computers." Roberto Goizueta (former CEO of Coke) gained respect when he said, "Hey, launching New Coke was a big disaster, my fault and I'm sorry!" Vulnerability can be a sign of strength.

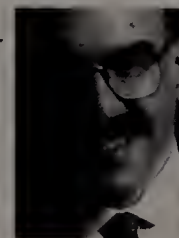
False bravado is a sign of childish machismo. If more CIOs asked for help, empowered their staff and got work done more efficiently, their departments would flourish. It would prove they are great leaders.

The One-Eyed Man

You may wonder, "Where's the ball-squeezing exercise for stress?" or "How about getting closer to my staff on a retreat to end burnout?" Stress and burnout do not get treated with "toys" or "quick fix" interventions; situation-specific strategies arrived at through a thorough analysis of your situation work best.

It's not just walking on eggshells that has you upset. After all, most CIOs can solve the problems they're called upon to address. What gets your goat is not being understood in time to fix those problems or, if you do, not being seen as a hero. Even if you escape the ax, you might want your career to be over rather than living with a Sword of Damocles over your head all the time. But if you tell yourself you're a one-eyed man in the land of the blind, that the blind will one day appreciate you, and that on some days you won't kill yourself to meet all the demands foisted upon you and instead you'll let the blind bump into walls and suffer contusions, you're coping. No squeeze balls, no tricks, just what Epictetus said: a different view. **CIO**

Dr. Steven Berglas, a psychiatrist, is an executive coach and consultant based in Los Angeles. He spent 25 years on the faculty at Harvard Medical School. His most recent book is *Reclaiming the Fire: How Successful People Overcome Burnout*. He can be reached at drb@berglas.com. Send comments to Executive Editor Alison Bass at abass@cio.com.





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Why Change Is an Affair of the Heart

In the drama of change, emotions, not logic, impel people to cast off the old and embrace the new



Everyone wants to know why so many IT projects fail to produce the business transformation they're expected to. The reason we found after years of studying large-scale change may surprise you. Our research, based on interviews with hundreds of executives in Fortune 1000-type companies around the world, revealed that it is not the complexity of the technology, a lack of buy-in from top management, high cost or the failure to create shareholder value that derails new projects. Instead, the single biggest challenge in any transformation project is simply getting people to change their behavior.

We also discovered that when people do change their behavior, it's rarely because they are offered a logical analysis that shifts their thinking but because they are shown a compelling truth that influences their feelings. Emotions are what trigger action—impelling people to behave in the often radically different and difficult ways that substantial change demands. We have found that at the heart of every successful change effort lies a three-part process: 1. seeing what the problems are; 2. feeling an urgency to solve them; and 3. being emotionally compelled to act.

Too Much Thinking Going On

Recent meetings we've had with more than 5,100 businesspeople around the world—including many IT leaders and professionals—underscore the importance of emotions in effecting change. When talking about their most successful projects, the vast majority of respondents said they were “feeling something” as opposed to “thinking about something” during the process. Steve Jobs' success at Apple illustrates the effectiveness

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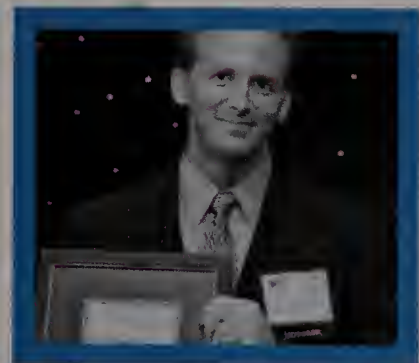
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of reframing a message that is simple, positive and emotional. When he returned to the company as interim CEO in 1997, Jobs recast Apple's image as a marginalized player in the battle for market share serving an elite hive of creative innovators who dared to "think different."

Yet many of today's business leaders, and CIOs in particular, find it difficult to change employee behavior, because they rely on the entrenched analysis-think-change pattern. This is the model that most of us learned in business school—data about the problem is gathered and analyzed, and logical arguments are presented via reports and lectures; people change their thinking based on these "hard facts," which motivate them to take action. CIOs, typically steeped in analytical training, are even more apt to follow this pattern and overlook the

These types of actions evoke a visceral response that short-circuits the emotions that block change (complacency, fear and anger) and enhances those that support it (urgency, optimism and faith). Although logic is important for establishing the business case for change, it does not carry the same motivational clout as emotionally charged ideas.

Creating Buy-In

In addition to demonstrating compelling concepts, successful leaders also assemble teams of people who are powerful enough to guide large-scale, organizational change. These teams are charged with creating a clear and practical direction for the transformation. Once again, these activities are most effective when people are able to see the possibilities and

Emotions are what trigger action—impelling people to behave in the often radically different and difficult ways that substantial change demands.

emotional element of change. Although analyzing and thinking are important, we found that seeing and feeling must be present in order to impel people to change their behaviors.

Setting the Stage

Our research revealed that there are three basic phases to the change process. The first, the preparation phase, typically involves heightening the sense of urgency, generating a clear and achievable vision, and creating guiding teams. Like powerful fuel, these activities compel people to take action. One of the most effective ways to initiate change is to use compelling, eye-catching, dramatic situations to get people to see what the problems are and to feel an urgent need to resolve them. For example, one IT team at an energy company put on a play that demonstrated the effects of inefficient manual processes versus those of a proposed real-time system. The play highlighted the frustration that occurred when balls were dropped, such as when someone took a power generator out of the maintenance facility but forgot to record it, creating an unpleasant surprise a few days later for the next person who needed one and could not find one. In comparison, a real-time system would have circumvented this problem by sending an automatic purchase order to the supplier for another power generator.

At another company, an executive placed stacks and stacks of overpriced supplies on a boardroom table to highlight inefficiencies in the purchasing process so that top leadership could see the consequences of what they were allowing to occur in the field. Yet another "blew up" a posh executive suite and replaced it with offices that encourage collaboration and conversation.

connect with them on an emotional level. For instance, a CIO at a major food company went beyond simply talking to employees about what a new ERP system could do and how it would integrate with different areas of the business. He made the system tangible by assembling teams from each business process and giving them pieces of colored string that represented parts of the system configuration. The teams connected their strings to each other's in spots where an integration point took place. The resulting multicolored Web demonstrated how the whole business was interconnected and how finance served as the backbone for all of the other parts—procurement, human resources, production planning and so on. In this way, the CIO established a clear vision of an efficient enterprisewide system, while simultaneously communicating why collaboration and integration were so critical.

Empowering Employees

Once people are ready and willing to move, the second phase of the change process builds momentum by enabling and empowering the whole organization. During this phase, effective leaders continue to influence people's feelings by communicating with their stakeholders for buy-in, enabling the workforce and generating short-term wins.

Our research revealed that the most effective leaders secure support for the vision and strategies by communicating via simple, candid and heartfelt messages that address people's emotions. Also, they communicate widely through multiple channels, ensuring that they reach all levels of the organization with a consistent message.

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Show and Tell

We also found that successful leaders remove the barriers to change—whether that means removing a disempowering boss, fixing inadequate information and information systems, or boosting employees' self-confidence. For example, one information technology company we interviewed was embarking on an enterprisewide service improvement initiative. Because the

aging supply chain and production processes.

To ensure that his vision became a reality, he first learned how to use the system himself so that he could understand its full capabilities. Also, he gauged buy-in by asking his plant managers questions that could be answered only by using the new system. What he found was a mix: 30 percent of the managers were using the new system fully; 40 percent were

Learning to rely more on show and less on tell is the single most important thing CIOs can do to improve their change leadership abilities.

initiative was so large, it would involve substantial process change as well as organizational restructuring. Naturally, employees were anxious about how this project would affect them. Would they lose their jobs? Would they be asked to perform different functions? Was the initiative feasible or would it result in chaos?

To quell anxiety and boost confidence, the new CEO called all 200 employees into a meeting in which he spoke about a similar initiative he had undertaken at another company. During the presentation, he displayed charts that clearly illustrated how similar process changes in his old company had made the organization more efficient. He even showed videos of people at his former company talking about their hopes and vision for the future before the change and then their exuberance actually living the vision in the new organization. Perhaps most important, he answered employees' questions candidly and reassured them that change of this magnitude had happened before and had succeeded without people losing their jobs. Because the CEO had been there and because he had genuine concern for their feelings, the employees bought into the change.

Sustaining Change

The last phase—implementing and sustaining the transformation—focuses primarily on the change aspect of the see-feel-change pattern. In the best cases, change leaders don't let up; they monitor, measure and reinforce behavioral change until the transformation becomes a reality. Furthermore, they make change stick by nurturing new behaviors so that they become the way things are done in the organization. For example, a business unit CEO at a manufacturing company had a clear and comprehensive vision of what a new real-time ERP system could do. To him, the goal was not just to implement the system but also to maximize its value by getting everyone to use it as an everyday business tool for man-

aging supply chain and production processes. To address this situation, he asked the field leaders who were using the system to focus on getting the partial users up to speed. He then worked to bring the nonusers on board by making it clear that his expectation was that this is the way things are done now at the plants. For instance, he'd call and

ask questions, such as: "Why is inventory growing the way it is? Why do we have overruns on these products? I saw that XYZ didn't ship. What's going on?" Most of the reluctant managers ultimately accepted the system; a few holdouts left the company. Although the CIO was responsible for ensuring that the system worked, tenacious leadership from the business unit CEO was necessary to get leaders to use the system.

The Secret to Leadership Success

For CIOs who have to convince business executives of the value of new technologies, the see-feel-change pattern is especially critical. To be successful, they must demonstrate the technology's value as well as quantify it in a business case. Conducting practical demos and giving people hands-on opportunities to experience the technology are two powerful ways to get business executives to see and feel the need for change. While analyzing and reporting may come naturally to IT professionals, learning to rely more on show and less on tell is the single most important thing they can do to improve their change leadership abilities. **CIO**

Dan S. Cohen is a partner with Deloitte Consulting and coauthor of the international best-seller, *The Heart of Change*. His latest book is *The Heart of Change Field Guide: Tools and Tactics for Leading Change in Your Organization*. He can be reached at dacohen@deloitte.com. Send your comments to Executive Editor Alison Bass at abass@cio.com.



Change Management

Have you relied on show, rather than tell, in selling an important IT project? Share your tips by going to the online version of this column at www.cio.com/120105.

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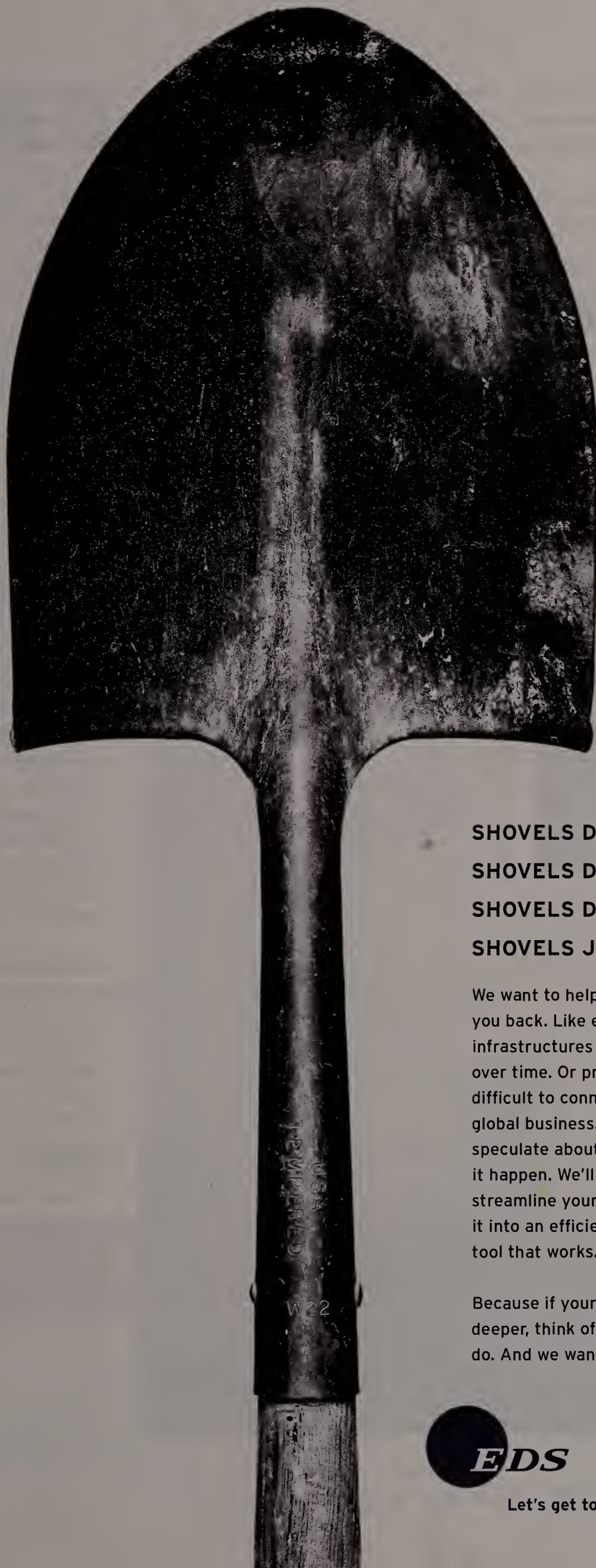
WHY PAUL LEVY LOVES HIS CIO

The CEO of Beth Israel Deaconess Medical Center knows technology saves both lives and money. That's why he's agreed to give his IT department an automatic transfusion.

BY JAMES PATTON

When Paul LEVY first took the job of president and CEO at Boston's Beth Israel Deaconess Medical Center in January 2003, he knew that a strong IT department would be the key to turn around the troubled hospital. Before Levy was executive vice president for the Harvard Medical School and Beth Israel Deaconess, he was Harvard's teaching hospital. He accepted the job at Beth Israel partly because he believed that the hospital's CIO, Robert M. Lippman, was essential to the hospital's future. "It's down and out," Lippman told the IT department

Paul Levy, president and CEO of Beth Israel Deaconess Medical Center, says some IT investments are necessary to improve patient care, even when the financial ROI isn't clear.



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lacked strong leadership and talent, there would not have been sufficient time to turn it around before Beth Israel Deaconess collapsed, he says.

Levy's trust in Halamka was soon tested by a massive network failure that took the hospital's systems offline for days. (Read more about the network crash online at www.cio.com/120105.) But Levy didn't fire his CIO. Instead, he educated himself about the need to invest in and maintain infrastructure. Nearly four years later, Beth Israel Deaconess is profitable, and the medical center has regained its standing as one the country's foremost teaching hospitals and health-care IT innovators.

Levy is best known for overseeing the cleanup of Boston Harbor as executive director of the Massachusetts Water Resources Authority from 1987 to 1992. "People laugh

when I say this, but there is a similarity between running a sewage treatment facility and running a hospital," he says. What comes into a wastewater treatment system, like what comes into a hospital, "is unpredictable and highly variable." And the outcome of treatment, whether for wastewater or patients, "has to meet very, very strict quality standards." But running a hospital is more complex because every patient requires individual attention.

Levy says Halamka has taught him much about how complex the health-care environment is—and how difficult and expensive it is to apply IT to traditionally paper-based processes such as drug-ordering and medical record-keeping. Nevertheless, Levy wants the hospital to use IT not only to improve its efficiency and quality of care for patients but also to pioneer how technology is used in health care.

Levy talks about how IT can improve hospital efficiency and patient safety, and how he makes hard decisions about IT spending.

CIO: As CEO of Beth Israel Deaconess, what is your vision for IT?

Paul Levy: Information technology is going to transform the delivery of health care in several respects. First, it will transform administrative processes, which include the back office, billing and communication between providers, insurance companies and consumers.

Secondly, it will transform our logistics. We will be able to monitor the flow of materials, medical devices, pharmaceuticals—even human tissues and fluids—through the organization. And we will therefore be able to optimize our operations.

Thirdly, it's going to transform health-care quality and safety, because we will be able to see much stronger correlations between the actions we take with patients and the results we obtain. For example, we get thousands of patients a year with inflammatory bowel disease. What I envision, and what John Halamka envisions, is that we will be able to look at those patients statistically—at what we did with them and for them—and we'll be able to correlate that with the outcomes. And that information will be used to enhance the delivery of medical care.

Our intention is to set the standard in this field. We fully expect to have, if not the best, then one of the best information systems in the country. So I could not overstate IT's importance to us as a business proposition.

Given that vision, what are your priorities for IT investments?

There are three areas: the administrative systems, logistical operations and health-care quality. I would like to have fully conceived and implemented information systems that permit us to optimize what we do in those three areas.

We have a good foundation that consists of clinical and administrative systems that work reliably, and that are accepted and routinely used by medical and administrative staff. But I think John would say there's still a lot to be done, and that it'll be pretty expensive getting there—tens of millions of dollars. We're still trying to get away from paper in certain respects, and John is focused on this area. One of John's latest projects is to have an electronic consent

Beth Israel Deaconess Medical Center

Headquarters: Boston

Industry: Health care

2004 Revenue: \$973 million

Employees: 5,727 full-time equivalents

IT Executive: John Halamka, CIO



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form, so a patient would sign a tablet [and the form] would enter into the patient's electronic record instead of sitting at the foot of the bed. This would provide us with a more reliable record that can't easily get lost.

Moving away from paper will save us money because it will reduce the amount we spend in records management. For example, we store paper records onsite, and we archive older records at a warehouse. It's difficult and time-consuming to retrieve them when we need them in a hurry.

You went through a period of cost-cutting. How has that affected your ability to invest in new projects?

When I came in we had to cut the budgets dramatically. At the time, the hospital was losing \$70 million a year. The first year, we had to cut \$30 million, and the goal was to break even by the third year. And John volunteered budget cuts in IT. If anything, however, we were probably spending below what we should have on IT, relative to the size of the enterprise. So we're trying to make up for that now that we're profitable. We had a consulting firm look at our overall investment and staffing in IT last year, and they determined that we have a lean IT department that could use some expansion. We're now in the process of expanding the department so that working conditions are better and so that staff continue to be interested in what they do. Beth Israel Deaconess's IT budget amounts to 1.9 percent of the hospital's overall budget and is increasing as Beth Israel grows.

There are systems such as electronic medical records that are expensive, and the payback is not immediately apparent. Then there's the issue that IT in the health-care setting can have life-or-death implications. How do you take these factors into account when making investment decisions?

Where there's an explicit issue regarding patient safety, where having a system in place is clearly going to make a difference in lives or deaths, you do it regardless of the cost. But those are the easy cases.

The more difficult decisions are about the systems that give you an improved information flow, where you suspect if you had

"Our intention is to set the standard in this field. We fully expect to have, if not the best, then one of the best information systems in the country."

—PAUL LEVY, CEO, BETH ISRAEL DEACONESS MEDICAL CENTER



that information in place, you would make better decisions about patient care. And there, it's a matter of IT judgment and medical judgment. We get people together and we talk about it. We look at the experience in other places, if it exists. The problem is—or the advantage, depending which way you look at it—is that we're inventing some of what we're doing here.

For any capital investment, whether hardware or software, we do a full business analysis and then rank it according to several criteria. First of all we consider patient safety. Second, we look at the number of doctors or patients that would benefit from it. Third, we look at ROI, and then fourth we judge whether the investment is consistent with our overall strategic plan.

The network crash in 2002 revealed that Beth Israel Deaconess had not invested enough in its infrastructure. What have you done to make sure this won't happen again?

We completely rebuilt the network after the crash, and the new one is much less vulnerable. That said, I wouldn't attribute all of that failure to an explicit lack of investment in this area. There was also a lack of vigilance of how the traffic was flowing within the network and what had been added on to the network. That all may have been compounded

by lack of investment. We understand now what it takes to keep the network up-to-date. And John now has a budget that is sufficient to keep the network running smoothly.

Do you ever say no? Your CIO is somewhat of a risk-taker. For example, he had an RFID chip implanted in his arm to test the technology as a tool for tracking patients and their medical information. What would be going too far?

The guy's got a great imagination, but he's well-grounded in terms of what's appropriate. We're seeing nearly 40,000 inpatients a year; we're not going to experiment with our patients. We want to be on the frontier, but the systems have to work.

I don't need to put any limits on John because generally I'm not involved when he is making decisions to try new things out. He's not going to do something without talking to members of the hospital staff. He's dealing directly with the experts. Not only do I have trust in him personally but I know that he consults with the appropriate people on a regular basis and he certainly would never knowingly do anything that would jeopardize the hospital. **CIO**

Senior Writer Susannah Patton writes frequently about health care. Contact her at spatton@cio.com.

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A SEASON

Like the past five, this holiday season promises to be a downer

ON THE

for most big stores. But not all. Two department stores are relying

BRINK

on IT to buck the downward trend. BY MERIDITH LEVINSON



PHOTOGRAPHY BY CHRIS BEAUDOIN



Once upon a time, big department stores were the preferred destination of holiday shoppers. Those cathedrals of commerce lured millions of moms and dads, grandmas and grandpas, and girls and boys through their revolving doors with magical, theatrical Christmas displays. Every Yuletide (beginning in November), they decked their halls with boughs of faux holly and set Christmas trees bedecked with lights and tinsel at the end of every aisle. Gift-wrap departments bustled with elves tying satin bows. Children—dressed in puffy parkas with mittens dangling from their sleeves, their

cheeks crimson from the cold and their eyes shining with excitement—lined up to sit on Santa's lap. Shoppers marveled at the spectacle as they crowded the stores in search of stocking stuffers and the finest gifts to secret under their trees. ■ But that was then.

Reader ROI

- :: What specific problems beset big store retailers
- :: Which technologies can improve performance and increase profitability
- :: Where the resistance to technology implementations comes from

Though department stores continue to spruce up for the holidays, they can no longer rely on theatrics to bring in the shoppers. Now they rely on holiday sales—pre-, not post—and that's not good for their bottom lines because sales eat into profit margins. Even Santa has abandoned the big store. He's moved his operations from the heart of the store to the center of the mall, and that's where consumers are increasingly spending their holiday bonuses. They no longer crowd department stores in search of that something extra special for that extra-special someone. Instead, they head to Brooks Brothers for their husbands, Chico's for their wives, Abercrombie & Fitch for their teenage sons and daughters. And when they leave the mall, they head across the highway to Wal-Mart to pick up toys for their tots.

Or they go online.

Last year, consumers spent \$23.2 billion online during the Christmas season, according to Goldman Sachs, Harris Interactive and NielsenNetRatings, which was a 25 percent increase over the previous Yuletide season. Holiday sales across different brick-and-mortar stores rose just 2.3 percent from 2003 to 2004, compared with 4 percent from 2002 to 2003, according to the International Council of Shopping Centers (ICSC), a trade group that tracks and reports retail sales.

This holiday season isn't looking much better for retailers, but it's looking especially grim for the big department stores. Record-high gas prices have cut into consumer spending. A survey of 7,000 Americans conducted by Big Research, a provider of consumer market intelligence, showed more than 70 percent of Americans shifting their spending from luxuries to necessities because of staggering fuel costs. The National Retail Federation predicted holiday sales at discount, department, grocery and specialty stores would rise 5 percent this year, to \$435 billion from \$414.7 billion the previous year. The 5 percent bump is lower than last year's 6.7 percent jump over 2003 and the slowest growth in holiday sales since 2002. (For more data on department store declines, see "Taking Inventory," this page.)

In other words, "Ho, ho, ho" is rarely heard in the big department stores these days. More often, Santa and his helpers are saying, "Ho, no."

WHAT THE BIG STORES ARE UP AGAINST

This move of consumers away from department stores in favor of specialty stores isn't new. Department stores have been struggling with lackluster growth for years due to several intractable problems:

- ▶ **They all look the same.** Nothing distinguishes one store from another, so customers don't have a compelling reason to pick one over another.
- ▶ **They're difficult to shop in because, to save money, they've cut back on staff.** Consequently, there are fewer employees to organize merchandise on their endless racks and shelves and fewer salespeople to help customers find their size, color, style or brand.
- ▶ **The merchandise is bland.** Trying to stock something for everyone has produced collections that frequently have nothing for anyone.
- ▶ **With their constant barrage of sales, department stores have trained customers to shop on price, which further limits profitability.** "Department stores live and die off the weekly sale, so merchandise is driven by price point, not by quality or style or what the customer really wants," says George Whalin, president of Retail Management Consultants. (For more on the once happy, now dolorous history of department stores and how they got into this fix, see "Big Stores, Big Problems," Page 66.)

Paula Rosenblum, a former CIO at iParty and Domain Home Fashions and director of retail research at Aberdeen Group, says IT can help the big department stores address all or most of these challenges in a number of ways. "By using technology to do iterative product design and to communicate more quickly and effectively with suppliers, they can re seize the fashion imperative," she says.

Two of the large department store chains—Nordstrom and J.C. Penney—have in fact turned around their operations (which had suffered during the late 1990s), thanks to sound management and smart investments in IT. Today, both are bucking the downward trend and outperforming their competitors.

Taking Inventory

How the big department store chains stack up

BELK: 275 U.S. stores
2003 net sales of \$2.2 billion
2004 net sales of \$2.4 billion (8% increase)

DILLARD'S: 329 U.S. stores
2003 net sales of \$7.59 billion
2004 net sales of \$7.52 billion (1% decrease)

FEDERATED DEPARTMENT STORES: 450+ U.S. stores
2003 net sales of \$15.2 billion
2004 net sales of \$15.6 billion (2.6% increase)

JCPENNEY: 1,015 U.S. stores
2003 net sales of \$17.7 billion
2004 net sales of \$18.4 billion (3.6% increase)

NORDSTROM: 153 U.S. stores
2003 net sales of \$6.4 billion
2004 net sales of \$7.1 billion (10.6% increase)

Fr: a wide range of information management challenges

To: a wide range of software to overcome them



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HOW I.T. CAN HELP

Last year Nordstrom created what is essentially a customer database (with vendor Blue Martini Software) that sales associates access through cash registers to identify which customers to contact with information about new merchandise, trunk shows and sales. For years, Nordstrom's best salespeople had used written notes to keep track of customers, their sizes, favorite colors, brand preferences and so on. The computerized system makes it easier for all sales associates to capture and share this information.

Also, in 2002, Nordstrom began implementing an inventory management system from Retek (now owned by Oracle Retail) and a replenishment system (also from Retek) during the first quarter of 2005. The inventory management system helps merchants do their preseason and in-season planning and forecasting by essentially guiding them through those processes and giving them access to historical sales data. The replenishment system helps the company turn inventory faster for basics such as underwear and T-shirts. Since Nordstrom began using its inventory management and replenishment systems, the \$7.1 billion company has increased its inventory turns every year (and by 10 percent in 2004) while its selling, general and administrative (SG&A) costs have declined every year since 2000. Nordstrom's SG&A costs were 28.3 percent of sales in 2004 compared with 31.5 percent of sales at Federated Department Stores, which operates Macy's and Bloomingdale's. Average inventory per square foot has declined steadily at Nordstrom's 153 stores since 2002.

J.C. Penney has also improved its supply chain. The \$18.4 billion company established a factory-store system in 2003 that creates a direct link with many of its suppliers for its private label merchandise. This link allows J.C. Penney to order merchandise as needed as opposed to at regular, preestablished intervals, thereby preventing out-of-stocks. And by improving communication between Penney and its suppliers, the factory-store system has also helped the retailer reduce the time it takes to get an idea for a product into a store from as long as two years to just 45 days. Additionally, the company reports that it has saved approximately \$30 million in average monthly inventory investment. In 2004, Penney also rolled out new planning, allocation and replenishment systems that help merchants



Big Stores, Big Problems

A brief history of the rise and fall of the cathedrals of commerce

THE GOLDEN AGE of the big department store began in the 1920s, about 70 years after Aristide Boucicaut founded the first department store, the Bon Marche, in Paris in 1852. Retail palaces known for their ornate design and their bewildering variety of merchandise were constructed by the leading architects of the day. Department stores, from Dillard's and Belk in the South to Macy's, Bloomingdale's, Jordan Marsh, Filene's and Lord & Taylor in the North and countless others in between, quickly became fixtures across the United States.

Sixty years after that golden age, department stores began to fall out of fashion. Contrary to popular belief, Wal-Mart is not the root of all their difficulties, though it has certainly exacerbated them over the past 10 years by making consumers so acutely aware of price. But the real cause of department stores' decline was the rise of "category killers"—superstores devoted to one category of merchandise, such as office supplies, hardware, books or sporting goods, says retail historian Robert Spector. "All these specialty retailers like the Circuit Citys and the Staples made it impossible for department stores to sell electronics and office supplies at competitive prices."

Department stores haven't found a reliable formula for success since then, so they've turned to mergers and acquisitions to show shareholders the growth they're asking for. Kmart announced its intention to purchase Sears in November 2004 and finalized that deal earlier this year. Federated Department Stores acquired May this past summer. And Saks put its department store group up for sale this past spring. But some industry experts don't think M&A activity is a strategy for long-term success. Says Paula Rosenblum, director of retail research for Aberdeen Group, "Merging a bunch of mediocre companies into one big one isn't the solution."

—M.L.

forecast demand, determine the right mix of merchandise and more effectively restock shelves each season in each store. Penney spent a total of \$70 million on IT in 2004. This year, the company estimates it will invest \$170 million.

While IT can't solve all the problems affecting the big stores, innovative CIOs can play a crucial role in improving their operations.

"If you're a big retailer and you don't learn the technology tools that are available to help you run more efficiently and wring out costs, you've got to be out of your mind," says Whalin. But, he adds, the technology that retailers implement has to be "something that really, truly helps the customer and is something that customers want." In retail, more than in most industries, the customer truly is king.

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NORDSTROM BRINGS HIGH-TOUCH TO HIGH-TECH

Nordstrom wasn't a first-mover when it came to technology. Throughout the 1990s the company's information systems lagged behind many retailers, according to Robert Spector, author of *The Nordstrom Way*, who's written about the company since 1982 when he was a stringer for *Women's Wear Daily*. Nordstrom's CFO Michael Koppel remarked in a presentation at a Credit Suisse First Boston conference in June 2002, "Our people at one time *were* our information system." Spector says the company had been reluctant to consider IT for many years for fear that technology would come between the store and its customers, and because it needed to find technology that would support and be accepted by its highly independent, commissioned sales staff.

Finally, during a 2000 sales slump, the company began buying IT, including financial software from Oracle, a warehouse management system from Manhattan Associates, inventory management software from Retek and business intelligence tools from Business Objects. Over the past four years, the company has

salespeople called the customers in their personal books. In 2002, Nordstrom and Blue Martini developed an application that mimicked the content and purpose of the notebooks and provided additional benefits to the company and to associates. For instance, by virtue of the point-and-click interface, the centralized, searchable customer database, and the business logic behind the software that analyzed customer behavior and purchasing patterns, the application made it easier for sales associates to manage and access the information (which they can enter manually) and to determine which customers would be most receptive to a call about, say, a Donna Karan trunk show, according to Brian Dean, vice president of marketing and strategy for Ecometry/Blue Martini, explaining in general how the CRM software works in department stores. When their shift begins, salespeople log on to the application, which then brings up a welcome screen with a list of people to call about various events, says Dean, adding that the list is automatically generated by the business logic underlying the system.

During the company's second-quarter 2005 earnings conference call, Executive VP Peter Nordstrom announced that use of the personal book software, which was rolled out to all stores in



Nordstrom has been able to lower the amount of inventory it carries. J.C. Penney has reduced the time it takes to get an idea for a product into a store.

reportedly spent \$350 million on IT and has found that technology has improved, not degraded, the customer service in which it takes such pride.

A prime example of a technology Nordstrom has deployed that complements its high-touch approach to retailing is its personal book software, which is essentially a CRM tool built on top of a customer database. Prior to installing the personal book software, sales associates kept track of their customers' contact information in notebooks they called personal books, the idea being that the better the salesman knew the customer, the better he could serve the customer and the more money the customer would spend with Nordstrom. When new merchandise came in,

2004, was in fact resulting in increased sales. Total sales for the first quarter of 2005 increased 7.7 percent to \$1.7 billion, compared with \$1.5 billion in sales during the first quarter of 2004. Total sales for the second quarter of 2005 increased 7.8 percent, to \$2.1 billion, compared with the same period in 2004. CFO Koppel said during a presentation at an A.G. Edwards conference in February of this year that approximately a third of all sales are a result of interactions between sales associates and customers facilitated by the personal book software. And in *The Nordstrom Way*, Spector writes that Nordstrom's best salespeople (those who gross \$1 million a year) owe 68 percent of the business they generate to the customers in their personal books.

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BEHIND THE SCENES: INVENTORY MANAGEMENT

Nordstrom has invested in two other systems that an analyst with Goldman Sachs characterized during Nordstrom's second-quarter 2005 earnings conference call as "a tremendous home run": an inventory management system and a replenishment application.

Before Nordstrom installed the inventory management system, which it began rolling out in 2002 and completed in 2003, sales associates had to count inventory manually, according to Peter Nordstrom. "That was not the most accurate way [to manage inventory], and it certainly wasn't very quick," he said during the company's fourth-quarter 2003 earnings conference call. In addition, merchants could neither track inventory by location nor as it moved through the supply chain. Because they couldn't tell which stores needed inventory and which stores were overflowing with merchandise, they had to discount a lot more product than they should have. Oracle Retail's Retek inventory management system, like the one Nordstrom rolled out, helps merchants forecast consumer demand for merchandise based on historical sales data and fashion trends, and it helps merchants determine the best way to spread their inventory dollars across men's and women's merchandise and among various types of tops and bottoms, according to Julie Driscoll, who handles customer implementation for Oracle Retail, which purchased Retek earlier this year. The system guides merchants through the inventory planning process by establishing workflows for each step in the process. Price optimization is done by a forecasting platform, built by Price Logic (now also owned by Oracle Retail), to model consumer demand and decision support. It also contains analytical tools that crunch the numbers and determined how to spread inventory dollars for merchandise allocation across stores to maximize sales and profitability, says Driscoll.

In the first quarter of this year, Nordstrom began rolling out a replenishment optimization application, also from Oracle Retail, designed to improve inventory productivity. The system tracks weekly sales data so that if a merchant sees that sales of, say, linen tunics in large sizes are sluggish in one store, he can then see which stores are selling those tunics the fastest and send stock from the warehouse there.

The inventory management system and replenish-

ment optimization application have worked wonders for Nordstrom. According to Koppel in the company's first-quarter 2004 earnings conference call, inventory levels declined steadily in 2003 and 2004, with total inventory down \$15 million or 1.6 percent in the fourth quarter of 2003 from the same period the year before, and down again by 5.3 percent during the first quarter of 2004. In addition, inventory turns increased by 10 percent in 2004.

Since implementing the replenishment optimization software, Peter Nordstrom reported during the company's second-quarter 2005 conference call, in-stock levels for replenishable merchandise (nonfashion items such as khaki pants, T-shirts, underwear and so on) improved almost 500 basis points, or by 5 percent, while inventory levels for those items decreased. And a basis point, says Aberdeen's Rosenblum, is nothing to sneeze at. It means Nordstrom has been able to lower the amount of inventory it carries without facing stock-outs, and that's the holy grail of all inventory management. Nailing inventory levels means fewer markdowns and greater profitability.

Nordstrom's results from its inventory system and replenishment application are especially enviable because these systems are not easy to implement. They require that almost all its business processes change, from determining what categories of merchandise to show in a particular store to the amount of space that will be given to a particular category, says Sam Israelit, a partner with consultancy Bain & Co., which specializes in retail. In the company's second-quarter 2005 earnings conference call, Koppel alluded to a learning curve Nordstrom's merchants had to follow. Nordstrom executives didn't elaborate on the problems they had implementing the system or getting merchants to use it, but Israelit says salespeople are often reluctant to use these systems because they view these processes more as an art than a science. Furthermore, because many retailers' merchandising departments are staffed lean, merchants are reluctant to invest time in learning to use new technology. Finally, accord-

ing to Israelit, merchants can find the technology threatening because it reveals which categories have inventory problems, which they used to be able to waive away through creative interpretation. Inventory management and replenishment systems enforce levels of accountability.

Rosenblum says retailers can overcome resistance in a variety of ways, including getting buy-in from the CEO, publicizing the initiatives inside the organization, and conducting pilots with clear metrics to confirm ROI.

Hot Technologies Who's using what

Inventory management/supply chain:
H&M, JCPenney, Nordstrom

Point-of-sale data collection and management:
JCPenney, Nordstrom

Web-based kiosks for customizing clothing:
American Eagle Outfitters

Handheld computers to ring up customers in line:
Proffitt's (formerly owned by Saks; now owned by Belk)

Handheld computers to check inventory:
Proffitt's

-M.L.

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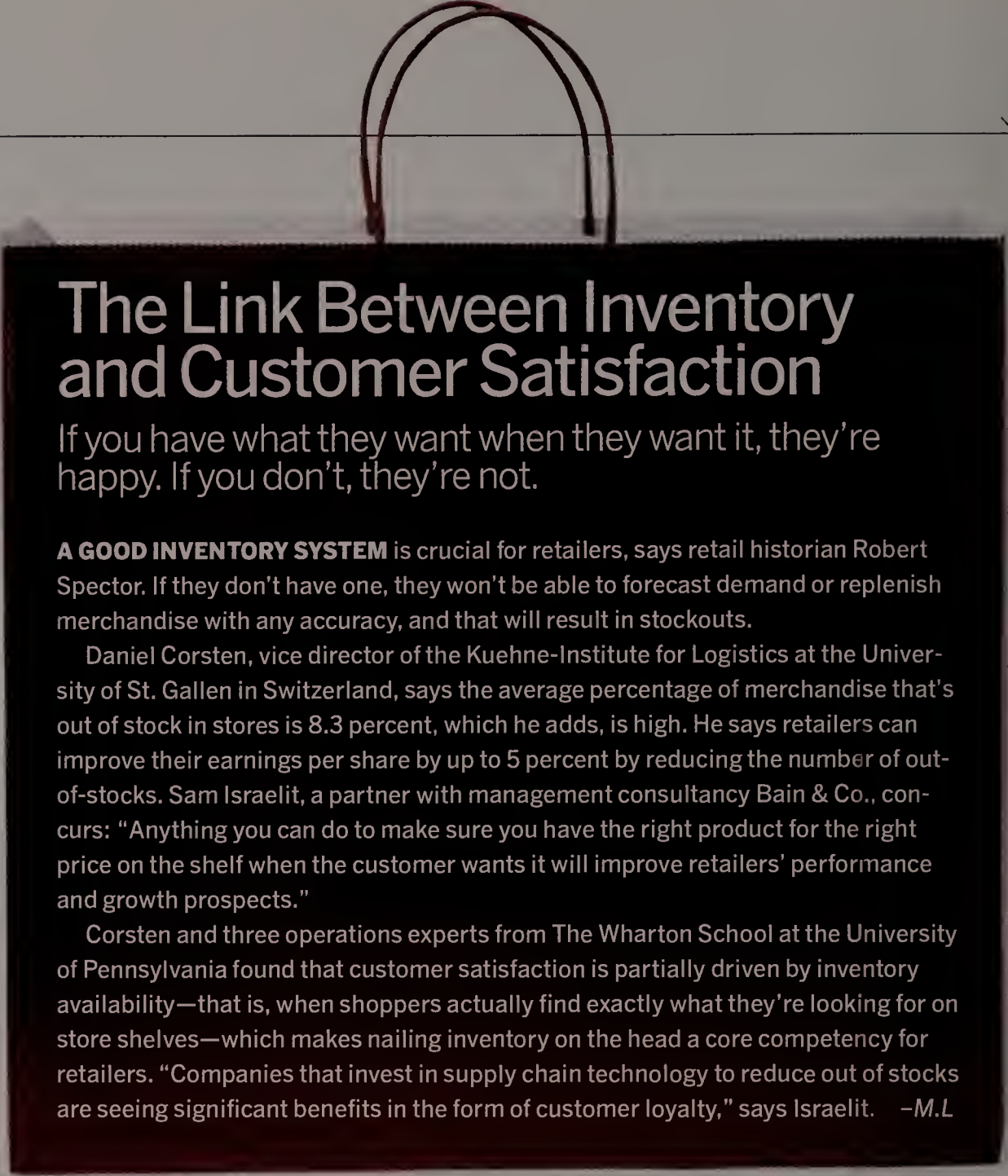
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FASHIONABLE I.T. AT J.C. PENNEY

Penney has also implemented new systems, including an inventory management system from I2 and a forecasting and replenishment system from Tera-data in 2002, with great success. J.C. Penney Executive VP and Director of Planning and Allocation Jeffrey Allison told analysts and retail executives at an A.G. Edwards conference in February 2005 that J.C. Penney has reduced the time it takes to get a product from the design stage to the sales floor from as long as two years to just 45 days due to changes in the company's supply chain and product development processes.

In 2003, J.C. Penney created its factory-store system, which enables the store to replenish such basics as towels, sheets, men's underwear and jeans on an as-needed, just-in-time basis "without tying up our capital in excess inventory," according to Peter McGrath, J.C. Penney's executive VP of product development and sourcing, speaking to institutional investors during the company's analyst day earlier this year. Since J.C. Penney can now get those items directly from its suppliers, who can produce them in a matter of days, the company no longer has to store them in warehouses, said McGrath. "The direct-to-store program allows J.C. Penney to ship weekly from global suppliers within five to seven days of receipt of an order. This saves J.C. Penney approximately \$30 million in average monthly inventory investment. Beyond reducing our warehouse inventory and improving our in-stock percents, we believe that cycle time and turnover should improve as well," added McGrath. Virtually all of the suppliers that manufacture J.C. Penney's private label merchandise are linked up to this system, according to Penney CEO Mike Ullman.

By enhancing electronic communications with suppliers, J.C. Penney can get fashionable clothes into stores faster and more often, which gives customers a reason to shop there more often. And that, according to McGrath, creates the potential for increasing sales. In addition, because of J.C. Penney's connections with suppliers, it only took eight months from concept to launch for the company to begin selling a new line of what it calls women's dressy casual clothes.



The Link Between Inventory and Customer Satisfaction

If you have what they want when they want it, they're happy. If you don't, they're not.

A GOOD INVENTORY SYSTEM is crucial for retailers, says retail historian Robert Spector. If they don't have one, they won't be able to forecast demand or replenish merchandise with any accuracy, and that will result in stockouts.

Daniel Corsten, vice director of the Kuehne-Institute for Logistics at the University of St. Gallen in Switzerland, says the average percentage of merchandise that's out of stock in stores is 8.3 percent, which he adds, is high. He says retailers can improve their earnings per share by up to 5 percent by reducing the number of out-of-stocks. Sam Israelit, a partner with management consultancy Bain & Co., concurs: "Anything you can do to make sure you have the right product for the right price on the shelf when the customer wants it will improve retailers' performance and growth prospects."

Corsten and three operations experts from The Wharton School at the University of Pennsylvania found that customer satisfaction is partially driven by inventory availability—that is, when shoppers actually find exactly what they're looking for on store shelves—which makes nailing inventory on the head a core competency for retailers. "Companies that invest in supply chain technology to reduce out of stocks are seeing significant benefits in the form of customer loyalty," says Israelit. —M.L.

Because of its investments in IT, J.C. Penney can do what no other mid-price department store chain has been able to do, according to Aberdeen's Rosenblum, and that's source and sell the fashionable clothes today's consumers are clamoring for and previously could find only in speciality stores.

ROLE MODELS FOR THE INDUSTRY

Baljit Dail, a partner with McKinsey & Co.'s IT practice, says the retail industry has been slow to adopt IT because in an industry where profit margins are so slim, retailers are often hard-pressed to justify the dollars required to implement the sophisticated point of service, supply chain, merchandising and inventory planning systems necessary to make them more efficient. But the success that's accompanied Nordstrom's and J.C. Penney's technology implementations doubtless will convince other retailers that IT isn't nearly as much of a gamble as trying to forecast trends and inventory a year to two years in advance.

And if it doesn't, perhaps another lackluster holiday season will. **CIO**

Senior Writer Meridith Levinson can be reached at mlevinson@cio.com.

Above and beyond typical upgrades

*Software agreements capture
real business value through Software
Assurance benefits programs*



Executive Summary

When it comes to software agreements, organizations may very well sign up simply for the upgrades. However, many find themselves looking for more value in their contracts. Enterprise Agreements (EAs)— with a new Software Assurance (SA) benefits program from Microsoft — now make upgrades and overall software acquisition much more lucrative. For example, through an integrated set of tools, services, and training resources for Windows®, these agreements can help ease the deployment and management of the software on an enterprise-wide basis, resulting in a windfall of perks.

Read this report to learn how IT leaders can negotiate software agreements that deliver the compelling business value of Windows.

THERE SIMPLY is no such thing as static software.

That's because IT environments are fluid — expanding with every new desktop, following mobile devices around the globe, and morphing as businesses grow.

Indeed, organizations must make certain that all software — for remote desktops and mobile laptops as well as every other form factor — is on the same, most-current version for a compatible and productive computing environment.

That's where volume-licensing agreements come in. At their best, they provide discounts for buying in bulk and ensure access to the latest software.

Problem is, most IT leaders in the past haven't experienced such agreements at their best.

Enterprises routinely commit to volume-licensing contracts that offer little by way of compelling business value. Discounts, yes. Upgrades, of course. Challenges? More than they bargained for.

"Licensing agreements" have become synonymous with "headache" in many IT groups, as volume deployments have

An EA is one of the most cost-effective ways to successfully acquire, deploy, manage, and use the Windows software desktop environment across the enterprise.

proven to be more arduous and expensive than expected. Among the speed bumps:

- Only some of their desktops are covered.
- IT staff is ill-equipped to handle the deployment, and vendor support doesn't come readily (or cheaply).
- Employees don't have the training they need to take advantage of new tools.

Bottom line: the upgrade is a bust.

Why upgrade?

With the right Software Assurance agreement, Windows software upgrades can have huge upsides that impact the bottom line:

INCREASE PRODUCTIVITY. Software Assurance provides upgrades that can spark employee effectiveness through productivity-enhancing tools and by providing faster, more secure mobile access. Smart information management — making it easier for employees to find, use, and share information — can be a huge productivity boost. For example, tests show that the Windows Vista upgrade offers search capabilities 80 percent faster than those of Windows XP. Upgrade enhancements that reduce PC downtime can also boost productivity.¹

REDUCE COSTS. Cost control is another benefit of SA agreements, helping organizations to maximize technology ROI. According to Ellinger, a recent Gartner study found that per-PC deployment costs range from approximately \$100 for zero-touch scenarios to \$1,000 for manual implementations. By comparison, Windows Vista Enterprise provides for 90 percent zero-touch deployments.¹ Better technology management also yields a reduction in desktop support for lower help-desk costs — a substantial figure, considering Gartner's claim that help-desk costs consume roughly 10 percent of IT operations budgets.

IMPROVE IT INFRASTRUCTURE. Optimizing the value of Windows software environments must always be top-of-mind. Organizations do this by constantly evaluating and implementing the features and functionality that bring the most business value. Software Assurance offers new enhancements, improved performance, greater stability, and enhanced security — all fundamental to software upgrades and key to IT integrity. Thus, upgrades can give organizations the confidence, investment protection, and security technologies they need to ensure top-notch infrastructure, always.

The Real Business Value of Software Upgrades

But good upgrades are all about good business and creating new business value. Organizations deploy technology for three basic reasons: to increase productivity, decrease costs, or improve the IT infrastructure. Each contributes to the overall health of the organization, thus making technology a critical part of business management.

"So organizations considering a major technology upgrade must look at its expected impact on the business," says Elan Ellinger, with client marketing of Windows products at Redmond, WA-based Microsoft Corporation.

Among the questions to ask up-front:

- Will the upgrade help employees do their jobs more effectively and efficiently?
- Will it ultimately result in cost containment or savings?
- Will it help scale and secure the corporate infrastructure?

As far as Ellinger is concerned, with the right annuity volume-licensing agreements and sound Software Assurance, the answer to all those questions is a resounding yes.

In fact, using the Gartner Total Value of Ownership (TVO) methodology, Microsoft and Intel were able to jointly illustrate that a client refresh improves information worker productivity, reduces IT operating expenses, and significantly improves IT capabilities. The average customer return on investment (ROI) was 206 percent.²

The Now Generation of Software Licensing Agreements

Full-annuity agreements help form collaborative partnerships between IT professionals and their vendors by delivering not only the software rights, but also tools organizations need to streamline the deployment and management of software.

The Vista Journey

Windows Vista Enterprise represents the next generation in Microsoft operating systems. It is optimized for enterprise-wide deployment scenarios, delivering enhanced workforce productivity and lower cost of desktop management through a more secure, high-performance infrastructure. Among other things, this upgrade:

- Helps protect corporate and end-user data and intellectual property at the PC level
- Enables integration of all Microsoft languages into a single corporate disk image
- Mitigates operating system migration application compatibility barriers with virtualization support for legacy applications
- Availability for both 32- and 64-bit architectures

The planned release for Windows Vista Enterprise is scheduled for 2006, with the following key milestones:

AVAILABILITY	KEY MILESTONE
2004	Windows XP Tablet Edition 2005, Windows XP Service Pack 2 (SP2)
2005	Windows XP Professional x64 Edition, Vista Client Beta 1 (H1 CY2005), Vista Client Beta 2 (H2 CY2005)
2006	Vista Client RTM (H1 CY2006), WinFS Beta, Virtual PC 2006
2007	Vista SP1, "Longhorn" Server

One example of such a contract is Microsoft's Enterprise Agreement. An EA is one of the most cost-effective ways to successfully acquire, deploy, manage, and use the Windows desktop environment across the enterprise. With EAs, organizations contract licensing for all their systems, enterprise-wide. They can opt to fully cover their platform, including operating systems, applications, and servers. Or they can cover subsets of the platform: for example, only the Windows Operating System.

Only with EAs are organizations eligible for new Software Assurance Entitlement benefits, which provide value-add beyond traditional upgrade and support contracts. "With Windows-based products, for example, an SA agreement includes the necessary tools, services, and training resources for successful deployment and management of Windows desktop software — exceeding what organizations typically get with a non-annuity agreement," says Ellinger. "And, of course, it includes all of the applicable upgrades. This is very significant right now, because upgrade rights include Windows Vista™, Microsoft's next-generation operating system, due out in 2006."

Using the Gartner Total Value of Ownership (TVO) methodology, Microsoft and Intel jointly illustrated that a client refresh improves information worker productivity, reduces IT operating expenses, and significantly improves IT capabilities. The average customer ROI was 206 percent.²

What's more compelling, an EA entitles organizations to a new unique version of Windows Vista Enterprise — that is tailored to the specific needs of large enterprises. It is optimized for large-scale desktop deployments: delivering enhanced user productivity and lower cost of Windows management, all the while providing the secure enhancements and high-performance infrastructure worthy of an enterprise environment. Windows Vista Enterprise is only available to organizations with a Software Assurance agreement; it cannot be purchased otherwise.

Look Before You Leap: The Five Essentials of a Software Assurance Agreement

When it comes to Software Assurance agreements for Windows software, the business benefits can be realized over the entire lifecycle of the software. Organizations just need to know what to look for. Here's a start:

■ **PLANNING.** SA agreements can help organizations fine-tune budget planning. Such contracts should enable them to spread payments and version rights over the term of the agreement rather than a forced, up-front payout. This allows organizations to plan and forecast spending for better use of the IT budget. It also helps them protect their IT investments, all the while gaining access to the most advanced Microsoft® software available.

■ **DEPLOYMENT.** Deployment challenges should be addressed through certain terms of SA agreements. For example, Windows deployment services and workshop options can help guide organizations and prioritize upgrades for the

¹ Source: Microsoft.

² Source: Gartner.

Microsoft Software Assurance Lifecycle Benefits

The Microsoft Software Assurance agreement entitles organizations to the following key features and benefits:

	FEATURES	BENEFITS
PLAN	• Distributed payments • Defer payments out 3-6 months	• Spread payments over the length of the agreement • Budget planning & optimization
DEPLOY	• Desktop deployment planning services • Deployment planning workshops <i>Business Value Discovery</i> <i>Architectural Design</i> • Windows Pre-Installation Environment	• 1-10 days analysis, process management planning and technical procedures services • 1-2 day planning sessions focusing on business value and architecture • Deployment automation
USE	• Windows Vista Enterprise • Virtual PC Express • Extended training vouchers <i>Instructor, online & self-paced</i> <i>Consultative learning services</i> <i>E-learning & on-demand</i> • Employee programs <i>Home Use Program</i> <i>Employee Purchase Program</i> • Enterprise Source License Program	• Advanced tools for workforce productivity and infrastructure performance • Application compatibility • Educational options to help workers leverage new software • Employee programs to promote use outside of work • Source code access for internal development & support
MAINTAIN	• 24x7 problem resolution services • "Cold backups" server licenses • TechNet Plus <i>Online chat and newsgroup services</i> <i>Beta release candidate & evaluation software</i>	• Around the clock support via phone or Web • Disaster recovery • Peer communication and technology resources • Advanced access to new software
TRANSITION	• Extended Hotfix Support • Fundamentals for Legacy PCs	• Extended support services • Virtual operating systems to emulate legacy systems

greatest business impact and lowest risk. In addition, deployment tool options help organizations to custom-build solutions to automate deployment, so IT spends less time and effort keeping desktops current.

■ **USE.** SA agreements should ultimately be designed to raise worker productivity. SA entitlement offers might include tools that help workers access information, collaborate, and work remotely. That means the SA should take into consideration the growing form factors, emerging applications, and security technologies required to maintain business continuity. Organizations need to keep close tabs on upgrades and weigh the impact of promised productivity, performance, scalability, and reliability against the status quo. SAs should offer training options to help users adapt quickly to new software.

■ **MAINTENANCE.** As one might expect, support services play a prominent role in SA agreements. Organizations should expect enhanced problem resolution support for Windows operating systems, servers, and applications. Problem resolution phone services and Web support must be part of the bargain. And, in light of recent man-

made and natural disasters, organizations should make provisions for recovery within their SA programs. Finally, IT professionals should expect access to the tools, resources, and reference material needed to support networks and desktops on an ongoing basis.

■ **TRANSITION.** SA agreements should also provide for extended support services for Windows products, covering older systems that have been transitioned out of mainstream use. Look for tools that can smooth the migration of legacy systems to the latest hardware and operating systems.

In the end, organizations can get much more business value from software agreements for Windows products than they have in the past. They're not just about upgrades anymore, so it's time to shed old misperceptions and consider new agreements. When organizations contract wisely, they'll end up with the productivity, performance, scalability, and security they need to improve their bottom line. ☼

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Business
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MASTERING MOBILE MADNESS

Wireless devices are multiplying, making more people more productive...and creating enormous management, support and security headaches for CIOs. You need a plan for juggling these new gadgets. Here's the plan.

BY THOMAS WAILGUM

Reader ROI

- How to determine who needs what device
- Why your beta testers should not be technologically sophisticated
- The hidden costs of deployment

You like to be in control. What executive doesn't? But mobile and wireless devices, for all their potential and allure, introduce an element of lawlessness to your carefully crafted systems. They take data outside the walls of the enterprise, and the moat you've dug around your digital castle—the hardwired firewalls and virus protection that guard your desktops—means less than nothing to them.

And there's no controlling the demand for these handy new gadgets. Everyone wants a Wi-Fi-enabled laptop or handheld so they can e-mail



their colleagues while sitting in the airport lounge or access critical sales applications on their network while meeting with customers. And now everyone wants a smart phone, a converged device that combines cell phone and handheld functions. At worst, these gadgets are status symbols. At best, they increase your workforce's agility and improve productivity. And since all these geegaws have become relatively cheap, how can you say no?

But the problem, says Richard LeVine, global lead for mobile security at Accenture, is that CIOs can only "try to align [their policies] with the users or butt heads with them."

"And if you butt heads, the users are just going to go around you."

What CIOs need desperately is a strategy for managing mobile and wireless devices. Elements of a good strategy include: first identifying if there's a business need for a device; segmenting your employees by job function; deciding on a list of devices that IT will (and will not) support; and last, devising a training plan for users and help desk staffers as well as enforcement mechanisms that will ensure device security.

If you try to fly without such a plan, you're sure to end up sitting amidst the charred ruins of a security and privacy disaster. Cautionary examples are multiplying daily. The recent incidence of laptop loss and theft—including the MCI financial analyst's laptop that went missing in April 2005 containing 16,500 names and Social Security numbers of current and former MCI employees—underscores the importance of securing devices with much more than a password. And then there's one of the more infamous accounts of BlackBerry boneheadedness: the Morgan Stanley exec who sold his dead BlackBerry on eBay for \$15.50 after he left the company. Turns out the batteries had just run out, and the new owner found hundreds of confidential Morgan Stanley e-mails still on the handheld.

"If you allow people to bring in devices off the street, you are going to have a loss of control," says John Killeen, director of global network systems at UPS, which supports nearly 200,000 wireless devices worldwide. "You need policy, standards and enforcement."

If CIOs can maintain a visible and enforceable policy, and involve users in the process from start to finish, then the security of the devices will almost take care of itself. "At least 70 to 80 percent of adherence to corporate security policies is self-enforced by the people," says Roger Entner, vice president of wireless telecom company Ovum. "If they have a positive attitude, you will have much more cooperation [with security]."

What follow are lessons from CIOs in four industries that cover the entire lifecycle of mobile and wireless devices. Through some preplanning, risk management and training, they've gained a measure of control over mobile devices while still allowing their employees enough flexibility to get their jobs

done. "Our challenge is to support multiple devices with multiple operating systems and capabilities so [that our users] are not constrained by the device," says Steve Novak, CIO of law firm Kirkland & Ellis.

Which sounds like a goal to which every CIO can subscribe.

DO THE COST-BENEFIT ANALYSIS

WHEN CIOs BEGIN evaluating a mobile and wireless device, they must first ask themselves, Is there a business need?

"You have to look at the benefit of what that person can get with the tool versus the added overhead cost of accommodating the tool," says Brian Bonner, CIO of Texas Instruments (TI). Bonner and TI take a pretty hard line on adhering to their mobile device standards. TI's users know that if a new toy doesn't correlate to TI's customer base or products, or if it creates an unnecessary risk, then Bonner isn't going to go for it. "It has to relate to how we serve a customer better or get a product to market quicker," he says.

So if the cost of the device, or the risk it generates, doesn't equal the business benefit, CIOs should just say no.

"It's no different than use of desktop PCs or laptops," says Eric Maiwald, a senior analyst for Burton Group who published an extensive report in March on handheld device security. "CIOs should use those same requirements and analyses with handhelds." In the Burton Group report, Maiwald points out that handheld devices are expensive for companies, both in terms of the direct cost of the devices as well as the added costs of protective mechanisms, such as encryption and authentication features, to secure them. "The use of handheld devices may increase employee productivity, but it may also increase the risk to the organization," he says.

So just what devices should CIOs roll out? Today's untethered knowledge worker usually needs a wireless laptop, and a handheld and cell phone—or a smart phone. Sales of mobile PCs, PDAs and phones grew 66 percent in 2004, according to In-Stat/MDR, and 90 percent of laptop PCs are now shipped with WLAN cards. Also appearing on the CIO's radar: camera phones, tablet PCs, Wi-Fi broadband connections for home workers, handheld scanners and RFID devices, and new hybrid Wi-Fi/cell phones arriving in North America from Asia.

Clearly, CIOs have a lot of options and need to decide which device will work best, what capabilities are needed, what security features will be critical and where the hidden costs lie.

For example, David Rensin, CEO of wireless and mobile consultancy Reality Mobile, says that the first step most companies take is to offer a wireless e-mail solution, frequently the BlackBerry. What happens next is that

WHAT YOU WORRY ABOUT

What is the largest obstacle to acquiring wireless technology?

Security	35%
Cost	19%
Reliability	16%
Manageability	9%
Availability	6%
Scalability	4%
Compatibility	4%
Don't know	5%

Note: Percentages do not add up to 100 because of rounding.

SOURCE: Forrester Research

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one group in the company will decide that having access to, say, the CRM system through a Treo device would really improve productivity. And then you end up with what Rensin calls “mixed deployments” in which the various devices don’t share a common infrastructure. BlackBerry’s require a BlackBerry Enterprise Server, while Treos usually use a GoodLink server. Rensin says that’s why the deployment of multiple device types can double costs.

On the flip side, Burton Group’s Maiwald says, while handhelds have a number of communication options, not all of them may be necessary. For example, a device that a salesman for a distribution company uses to take orders from customers may not need WLAN connectivity if the orders can be synchronized when the salesman returns to the office. “The added communication capability may introduce a higher cost and [security] risk without materially benefiting the organization,” Maiwald asserts.

DECIDE WHO TESTS WHAT AND WHEN

DECIDING WHO SHOULD be in the beta testing group is just as important as what device the group will test. “The first group of guys [in the beta test] is always the technology savvy, geeky testers,” Rensin says. “That’s usually a recipe for disaster.” The problem is that the geeks will troubleshoot problems on their own and make sure whatever you give them works. “The last guy you want to do the testing is the technology geeky guy,” Rensin says.

CIOs should divide their users into buckets. Here’s how Rensin breaks it down: First, the techno-geek power users. Second, the adventurers willing to try the new gadget. Third, the executive and management ranks. And fourth, the Luddites who will probably fight using it all the way. Then, take a small group (anywhere from 3 percent to 5 percent of the total) from two of the buckets—the adventurers and executive/managers—train them, and have them test the device over a couple of weeks, using it for at least 15 minutes a day. Next, survey them regularly about how the device is working. Here CIOs can look for patterns in features that aren’t working. If all goes well, then CIOs can start rolling out to the other buckets, saving the power users—the geeks—for last.

At Texas Instruments, Bonner set up a group for testing mobile devices three years ago. By design, it’s a combination of average users from marketing, sales and other knowledge workers, as well as some technical staffers. “You don’t just want gearheads,” he agrees.

Bonner’s group has been able to keep tabs on the needs of the users and decide on appropriate devices and testing mechanisms. For example, the group discovered that because TI is a global operation, any new smart phone would need functionality that could work for both voice and data all over the globe. “And when they traveled,” says Bonner, “people wanted to carry just one device.”

Segmenting your employees also allows CIOs to designate who will get what device, as well as what kind of access to the network and applications each employee will have. “You don’t just willy-nilly give the devices out. You have to do the proper requirements analysis [of each group],” says Burton Group’s Maiwald.

GOING MOBILE—FAST

Companies are adopting mobile devices faster than planned

	2004 plans	2005 deployed
Wireless e-mail or BlackBerry	39%	51%
Personalized contacts and calendar	30%	56%
Content/information for employees	23%	44%
Sales-force applications	20%	30%
Field service applications	20%	26%
Customer-facing applications	19%	28%

SOURCE: Forrester Research

WHEN LESS IS MORE

TODAY’S USERS ARE CLAMORING for even greater wireless access to corporate databases. Gartner estimates that 60 percent of Global 2000 workers have mobile access to corporate applications.

So does the executive suite really need souped-up laptops with access to CRM and the latest finance metrics, or can they make do with just a BlackBerry or Treo with e-mail and calendar access? “Most executives are oblivious to the security challenges,” Ovum’s Entner says. “You have to disarm all the security stuff because the executive can’t figure out how to work it.”

Therefore, less device (and less functionality) is becoming the norm, though security challenges persist because the smaller the device in physical size, the more easily it can be lost. Just because a device may be small doesn’t mean it’s any less important to secure.

At UPS, Killeen, as well as most of the top executives, have recently switched from laptops to either a BlackBerry or Treo handheld for purely functional reasons—the new devices enable execs to securely and easily check their e-mail, schedules and the Web, and make phone calls. Killeen’s segmentation plan is simple: If the user’s primary need is to access e-mail and the Web, she gets a smart phone. If the user needs to access business applications to do her job, she gets a laptop. “I don’t use my laptop any longer,” says Killeen, who has deployed about 3,000 BlackBerrys and 500 Treos.

Killeen has rolled out BlackBerrys to 1,800 field technicians in UPS’s 2,400 facilities. “Before, they were running around with what we called utility belts—cell phones, pagers, all kinds of devices,” says Killeen. The BlackBerry performs all those various devices’ functions—voice, e-mail, access to intranet and work orders—in one device, and Killeen says the drivers are able to accomplish more while reducing wireless expenses by more than 10 percent.

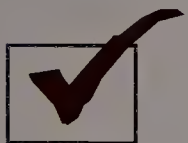
THE STANDARDIZATION WARS

PUSHING STANDARDIZATION TOO OVERTLY may raise user hackles (it feels oppressive), and when it comes to deploying mobile and wireless devices, CIOs need to pick their battles carefully. The risk of alienating users (who, if frustrated, will try to go around IT

Your wireless rollout



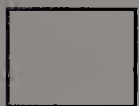
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with their own devices) is high. "You need to find a balance between minimizing the support costs and making your people happy and cooperative," Entner says.

CIOs Bonner, Killeen, Novak and Intelsat's Joe Kraus have all standardized on their laptop offerings—there's no choice permitted there. "It allows us to eliminate one variability in the mobile device environment," says Kirkland & Ellis's Novak.

But for cell phones and smart phones, these CIOs offer options. For Novak, his strategy takes into account the realities of his industry. His law firm's partners work with many clients, who have differing technology needs. So he tells his users what he can support now, letting them know that IT will do its best to work with the partners on any new device that they may need to use with a client. In return, he asks that his users let him know if they're using a device that he hasn't authorized. "What you don't know will come back to haunt you, so we're much more proactive," Novak says. "We set expectations that IT

is an open-minded organization."

Right now, the firm officially supports BlackBerry devices, but Novak still provides limited support for Palm and Windows CE devices necessitated by attorney-client requirements. However, Palm and Windows CE users don't necessarily get all the functionality of the BlackBerry. Right now, there's no Palm and Windows CE device for e-mail access that is supported by the firm. "You're always seeing the latest and greatest technologies," Novak says. "But what we've rallied around is standardization of what we can support."

UPS's Killeen has pushed hard on standards for the past several years, after spending years with none and hooking everyone's PDA into their Outlook e-mail application if they so desired. "What happens is that when there are problems, it's a support nightmare for those company devices that aren't really company devices," Killeen says. He now supports BlackBerrys and Treos, and employees can either buy their own or, if it's a part of their job, UPS buys it for them. "Devices

YOUR MOBILE AND WIRELESS DEVICE PRIMER

Prime players: Apple, Dell, HP, IBM/Lenovo, Panasonic, Sony

Uses: Has everything that the road warrior, telecommuter or traveling VP needs.

Best used by: Knowledge workers who need mobility and flexibility.

Strengths: Portable. Virtually all notebooks come with wireless connectivity these days.

Weaknesses: Though new models are lighter, they still can be a pain to lug around. And don't forget about battery life issues.

Fact: In May 2005, notebook sales in the U.S. market topped desktop sales over the course of one full month for the first time.

Prime players: Fujitsu, HP, Motorola, Nokia, Palm, RIM, Sony-Ericsson

Uses: Checking e-mail from outside the office and some personal information management capabilities.

Best used by: White collars who need access to e-mail as well as blue collars who need wireless application capabilities.

Strengths: Keeping your e-mail inbox under control while you're away from the desk or laptop; accessing the network from the field.

Weaknesses: Easy to lose. Meatier enterprise applications take their toll on battery life. Costs rise as security features are added.

Fact: The four main operating systems for these devices are: Palm, RIM, Symbian and Windows CE.

Prime players: Motorola, Nokia, Samsung, Sony-Ericsson and many others (manufacturers); Cingular, Sprint, T-Mobile, Verizon (carriers)

Uses: Global communication is just a phone call away.

Best used by: Everyone.

Strengths: Compact and cheap. New models have lots of features (such as multimedia) and can connect from almost anywhere in the world.

Weaknesses: All-in-one devices can be confusing for users. And those cameras are a security hazard.

Fact: The 180 million wireless subscribers in the United States used more than 1 trillion mobile minutes last year. Worldwide, there are more than 1.5 billion wireless subscribers.

Prime players: Fujitsu, Motorola, Nokia, Palm, RIM, Sony Ericsson

Uses: Access to e-mail, calendar, applications, telephony, personal information management and more.

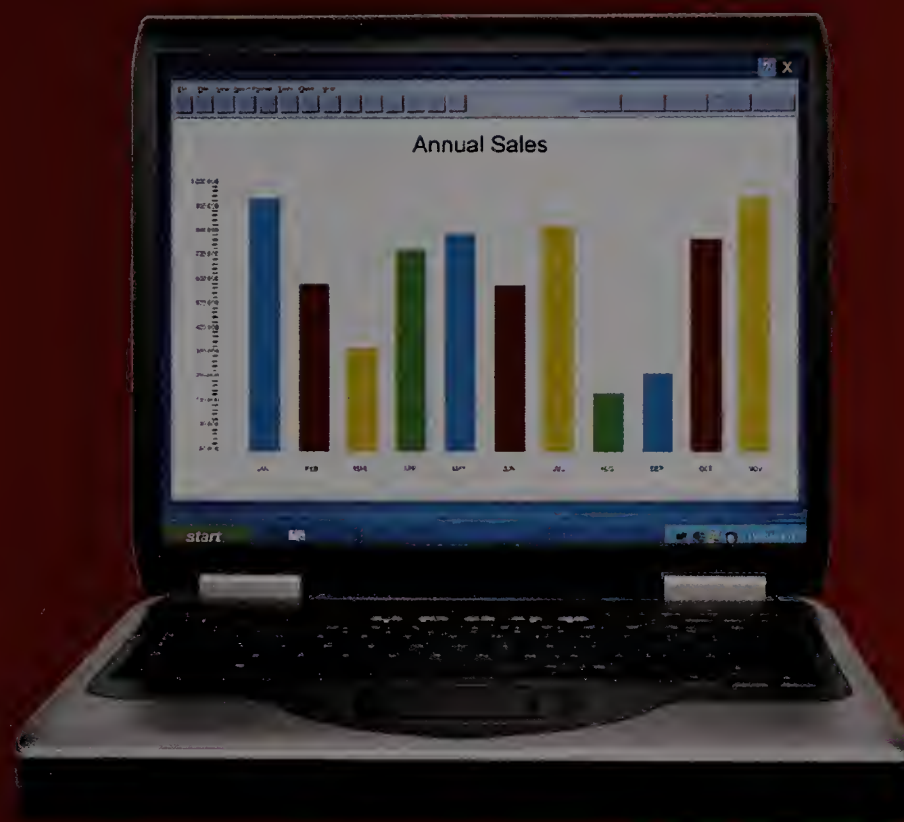
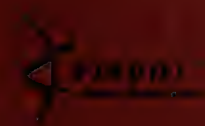
Best used by: Knowledge workers, field techs and execs who want enterprise access without the laptop.

Strengths: Can do almost everything reasonably well and can be taken most anywhere in the world.

Weaknesses: When you cram all that into one (tiny) device, issues such as typing on the (tiny) keys can be annoying. And the more features you add, the greater the security issues become.

Fact: Last year marked the first time that converged mobile device sales surpassed those of regular handheld PDAs.

SOURCES: Burton Group, Canalys, CTIA, Current Analysis, Forrester Research, Gartner, IDC and CIO reporting



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will change constantly," Killeen says. "And we don't want to be in the device business."

For his tens of thousands of cell phones, Killeen and other CIOs take a firmer approach. "People at UPS cannot purchase a cell phone unless they come through us," he says. "My organization has established contracts with carriers, and everybody's got to abide by us."

These CIOs also make it clear that if an employee wants to purchase a non-IT-approved device, they're on their own if it breaks or fails to work the way they want it to. That's part of the enforcement function. But that's not to say that, once a CIO makes a decision on a standard, nothing can change. "If there's a new need for a product set,

follow security guidelines—regardless of their computer proficiency. "You don't raise your children by yelling at them constantly," says Accenture's LeVine. "You explain to them, If you use this device in a compromised way, you may sink the firm and lose your job and your retirement." That's not hyperbole, LeVine says, just reality.

This past summer, Intelsat's Kraus held an information security awareness day for all employees of the satellite communications company, where he made sure that everyone knew about virus protection, identity and password management, wireless devices and protecting home PCs. At his law firm, Novak says he spends a lot of time in coaching sessions for security best practices. He also sends out

Not smart: 56% of users store confidential business data on their smart phone. But 60% of users surveyed say their company does not have corporate rules regarding the security of confidential data stored on their smart phones.

SOURCE: Symantec

we'll jump on it," TI's Bonner says. "Being a high-technology company, we have a lot of savvy users, and we try to run faster than them."

Running faster also means keeping pace with the security functions that should be on the devices. One of the most critical functions is being able to wipe a device remotely if it's lost or stolen. According to the Burton Group report, all data can be removed from a handheld device, such as a BlackBerry, by doing a hard reset. For a remote wipe, an administrator sends a command to the device to perform a hard reset, or the administrator can set a policy that a hard reset will occur after a specified number of failed attempts at logging on.

Other risk considerations for CIOs include making sure that basic power-on passwords are on the devices, encrypting wireless transmissions that contain sensitive corporate information, and ensuring that employee devices don't have cameras on them that they can bring into the office. The camera phone is the CIO's latest bane. Do you want customer service people taking photos of customer information? Bonner doesn't want employees taking snapshots of new design work. His policy is simple: "You can't have that," so phones need to be shut off when an employee enters the office.

SECURITY AND ENFORCEMENT

HOW MUCH TRAINING CIOs should do is dependent on how technically proficient their workforce is. For TI's Bonner, making his users sit through two hours of how to operate their new cell phone or smart phone would be a waste of time, not to mention insulting. Novak's lawyers simply won't make the time.

In organizations where users may not be quite so sophisticated (or difficult), CIOs should offer as much training as the user base needs. "Training costs time on the front end, but it really saves a lot of time on the back end because you don't have 25 people asking questions later, one by one," Ovum's Entner says.

CIOs have to ensure that users know how important it is that they

e-mails of tech tips that take users no more than 10 minutes to read. "Once you can explain in business terms why this is important, they can carve out the time to read it," he says.

CIOs also need to make sure that the help desk is well-versed in these new devices before they're rolled out to a single user. "That's where the disconnect happens," says Reality Mobile's Rensin. Far too often, the help desk gets thrown the BlackBerry or Treo training manual after the fact, and then they have to learn it while dealing with cranky users. Time and money lost in that process may be hard to quantify but "there's never any way to recover it," Rensin adds.

Enforcement of a device security policy is one of the biggest pieces of any overall mobile device strategy, especially in light of regulations such as Sarbanes-Oxley, HIPAA and Gramm-Leach-Bliley. If CIOs are going to "allow these devices, then they need to make sure their policies are enforced," says Maiwald.

One way to enforce a security policy is to track rogue devices, especially if you've decided not to allow any unapproved devices on the network. Tracking requires security software that can, for example, scan for unauthorized device-to-desktop synchronization, or unauthorized devices accessing your network through your wireless LAN.

If such a policy is in place but is not enforced, the risk to the organization may be greater than if the organization were to simply ignore the problem. That's because the existence of the policy may give the enterprise (and the CIO) a false sense of security, Maiwald writes in the Burton Group report. And if any employee leaves the company, CIOs have to make sure that his device has been wiped clean of all company information. (See "When the Bits Bite the Dust" for more on wiping hard drives clean at www.cio.com/100105.)

In the end, any mobile device "is only as secure as the human operating it," Ovum's Entner says. "No amount of software can change that." **CIO**

Staff Writer Thomas Wailgum can be reached at twailgum@cio.com.

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DOWN BUT NOT OUT IN NORTH CAROLINA

BY BEN WORTHEN

In an effort to keep track of their homeless population, community groups in Wake County, N.C., learned to work together and came up with a centralized system that improved care and saved the county money

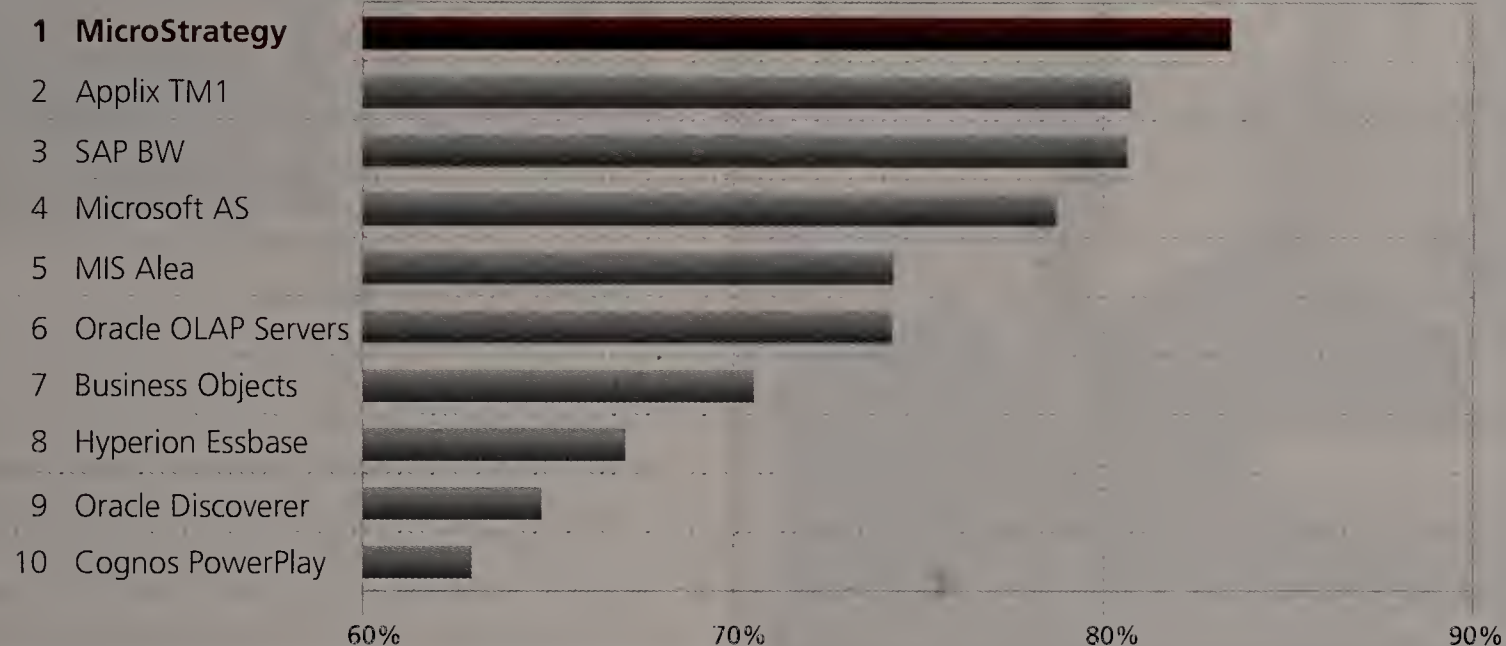
One day every winter, Wake County, N.C., counts its homeless. In the wee hours of the morning on that appointed day, staff from the county Human Services Department and Raleigh-area nonprofit and faith-based organizations load up their cars with food and clothing, and head to highway underpasses, cemeteries and campsites hidden in the woods behind the rail yard. They add the people they find there to the numbers spending the night in area shelters. It's difficult work, says David Harris, the county's director of housing services. The temperature hovers around freezing. Sometimes it rains. But

Reader ROI

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- :: How IT brought feuding community groups together to collaborate
- :: What IT learned about how to get these groups to work together

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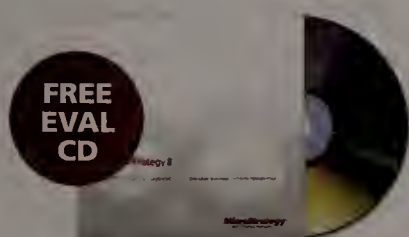


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Lib Wanner :: CIO, Wake County



David Stratton :: IT Manager, Wake County Human Services



Carson Dean :: Director, South Wilmington Street Center

Although nominally in charge of all Wake County IT projects, CIO **Lib Wanner** ceded day-to-day responsibilities for the homeless information system to **David Stratton** and community leaders using the system, such as **Carson Dean**, director of the South Wilmington Street Center, a men's shelter.

mostly it's that the homeless don't want to be counted—most are drug addicts, upward of 20 percent have mental illness and they generally want to protect the last shred of privacy they have left. Last year local newspapers publicized the count ahead of time. “The homeless hid,” says Harris. “They knew we were coming.” As a result, the 2005 count netted only 1,106 individuals, a finding that severely underestimated what the community knew about its homeless problem.

The less-publicized 2004 count found 1,235 homeless people, yet all the evidence indicates that Wake County's homeless population is growing, not shrinking. In Raleigh, someone earning the \$5.15 an hour minimum wage would need to work 119 hours a week in order to afford a two-bedroom apartment at fair-market rent. Census data indicates that 15,000-plus Wake County residents are living with friends or family because they can't afford a place of their own. Studies show that this group is at extreme risk for homelessness, and many drift in and out of shelters and transitional housing at some point in the year. The result is that family homelessness in Wake County is rising 11 percent a year (and overall homelessness by about 20 percent a year). “The one-night count isn't just inaccurate, it's inadequate,” says Richard Fitzgerald, resource consultant for the Raleigh Rescue Mission.

Yet the face-to-face count has long been the only way to ensure that the same person isn't counted twice. In order to get a more accurate sense of its homeless population, county officials and representatives from area nonprofit and faith-based organizations developed a plan to improve collaboration among the various agencies that serve the homeless, the jobless, the poor and anyone else considered at risk. At the heart of this goal is a homeless management information system (HMIS) that government and nongovernmental groups alike can use to create a single view of each homeless person in Wake County, track these people across the breadth of resources they use, and provide more informed and targeted services. Slightly more than a year after its October 2004 launch, 16 organizations are using the HMIS, and additional organizations, including local schools and hospitals, will be using it soon. And while Wake County will still hit the streets to count its homeless this winter (the one-night count is a U.S. Department of Housing and Urban Development requirement), county officials now have real numbers from the HMIS they can use to obtain the appropriate level of resources from government and private-sector contributors.

Between those additional grants and improved efficiency, the HMIS is poised to save Wake County millions of dollars. In addition, other communities nationwide are turning to Wake County as a model, not just for its database system, but for how to get different groups with different agendas to work together.

Despite its success, this collaboration project almost didn't get off the ground. Concerns about the confidentiality of homeless people in the system, distrust of the county departments that were leading the project and a reluctance to change the long-followed process were all issues that nearly stopped the project



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dead in its tracks. While many of these concerns predated the HMIS, the project's leaders realized that they needed to deal with these issues before they could make any further progress. So rather than forcing a system on reluctant users, the project leaders confronted each of these issues head-on and designed the system to meet the community members' concerns. The Wake County story contains important change management lessons for any CIO implementing a major IT project.

"A system can be an easy scapegoat," says David Stratton, the IT manager for Wake County's Human Services Department. "Projects like this tend to be a lightning rod for any unresolved issues in a community."

A History Lesson

IN 1996 HUD radically changed the way it gave funding to agencies that provide services to the homeless. Instead of considering grant applications from each agency, it decided to consider applications that came from the larger communities, local groups that HUD dubbed Continuums of Care (CoC). The change forced the various organizations dealing with the homeless within each community to collaborate. Today there are more than 400 CoCs covering the entire country.

The extent of the actual collaboration varies wildly, however. Martha Burt, a principle research associate at the Urban Institute who reviewed the CoC concept for HUD in 2002, says that about half of all CoCs just get together to write grants, and another third do some low-level yearlong planning as well. Only rarely do these community groups actually work together to provide care that could objectively be called continuous.

The Wake County CoC has 30 members, ranging in size from the county's Human Services department, which has 1,700 employees and nine buildings, to the Interfaith Food Shuttle, which has only one case manager and some volunteer drivers. Members of the Wake CoC had been meeting informally since the early '90s and had good working relationships. But these would be put to the test by a 2001 HUD mandate requiring that CoCs implement information systems capable of tracking at least 50 percent of a community's beds by October 2004. (Technically, HUD doesn't issue mandates as much as give suggestions for what would make a good grant application, says Burt. But because HUD funding

Step Aside, Stay in Touch

Corporate and county CIOs must learn to delegate responsibility to IT in the department involved in the project, but still be available to vet the budget and provide advice

WHEN THE WAKE COUNTY CONTINUUM OF CARE decided to pursue a homeless management information system, a project led by the county's Human Services Department, Wake County CIO Lib Wanner asked herself a question now familiar to CIOs: What is the appropriate role for a CIO during a departmental IT project? For Wanner it meant ceding the day-to-day responsibility to the Human Services IT staff, but carving out a niche where she could offer some targeted strategic guidance at the points, mostly around planning, where the project percolated up to the county level, as these projects inevitably will at times.

Wanner is cochair of the Wake County's e-government steering committee, which must approve every business application project the county undertakes. "My first job is to help people prepare proposals," she says. "I can vet the project and help make sure that they detailed enough scope." Wanner also helps the departmental IT people develop a project timetable, budget and reporting structure, and a formal close-out meeting two months after a project has finished.

It is crucial to remember, however, that it is a departmental project, she says, and as such you have to let those people do their jobs. The departmental IT people know the terrain, the requirements and the users the best, and it is important to give them enough space to run the show. "I'm just there to make sure they aren't missing anything," she says. —B.W.

is so competitive, local groups feel compelled to comply with the federal recommendations.) It was a tall order.

"When I first saw the mandate I thought, This is wonderful in theory because it will help end the controversy on the number of homeless people we have," says Rev. James Galloway, former executive director of the PLM Families Together, which offers transitional housing for single mothers and their children. "My practical response was, 'Oh, bleep.'"

Wake County had actually tried to build a common system for all its agencies once before. In the early '90s, the Triangle Community Foundation gave a grant to a local software developer to network the area's shelters together and write an application all of them could use. At the time, the participating agencies were concerned that the system might intrude on homeless people's privacy: The data would be saved on floppy disks and processed in an office in Chapel Hill, and there was no plan to safeguard the information or limit who had access to it. But before these concerns could be addressed, the grant money ran out and the project was abandoned. "It didn't end well," says Fitzgerald of the Rescue Mission. "We did just

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"Projects like [HMIS] tend to be a lightning rod for any unresolved issues in a community."

-David Stratton, IT manager for Wake County's Human Services Department

enough to make everybody mad." With the system no longer on the agenda, the confidentiality concerns receded below the surface. Business went on as usual.

When confronted with the HUD mandate for an HMIS, some members of the CoC advocated waiting, anticipating the government would withdraw the request. But as time went by and HUD stuck to its guns, the Wake County CoC developed a project proposal. The plan called for a Web-based application that all the agencies could use. Each homeless or at-risk person in the system would have a unique ID in order to avoid duplication, and service providers at different agencies would be able to access information about the client captured at other agencies. The whole thing would be hosted by the vendor (Softscape) in order to cut down on long-term maintenance. Wake County's e-steering committee, led by CIO Lib Wanner, approved the project

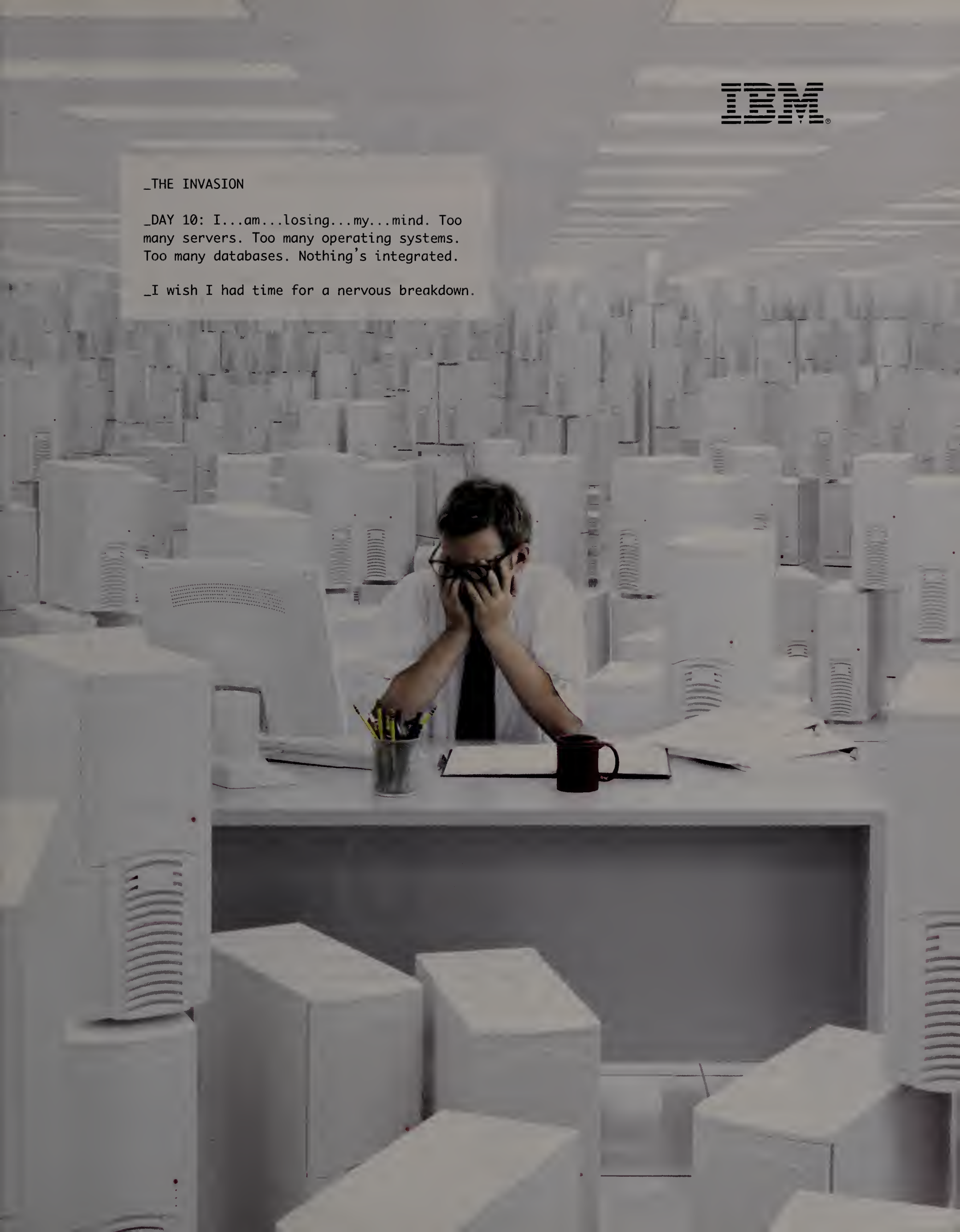
that July, agreeing to pay \$211,000 on top of \$20,000 from the Human Services budget and an \$80,000 HUD grant and \$111,000 from Wake County's Automation CIP fund. Wanner says the approval was a no-brainer; Wake County received about \$2.6 million from HUD in 2004, and if an IT project could help preserve that funding then the county was willing to invest. Wake County ranks proposed IT projects on a 0 to 280 scale, with projects needing a 122 or higher to get a green light. The HMIS proposal received a 199.6.

Raleigh Confidential

AS it became clear to members of the CoC that the HMIS was going to happen, old tensions began to resurface. "The first meetings had a lot of smart people with loud voices saying there was no way to make this system safe or secure," Galloway says. Client confidentiality was the biggest issue. The agencies collect all sorts of private information, including criminal records, history of drug use and domestic violence, and HIV status. Many were concerned that if the records were available online, unauthorized users such as law enforcement, county officials and agency staff who didn't need to know the information would be able to gain access to it. "There was a lot of suspicion of the people who were strongly for [the HMIS]," says Galloway. A visit from a HUD official sent to explain the benefits of an HMIS didn't help. Some of the CoC members were experienced computer users, but others had never touched a keyboard or used the Internet. The HUD representative tried to explain that an HMIS system would have built-in security that would ensure that only authorized users could view client records, but he came off like a computer nerd who didn't suffer fools lightly. "It was like raising a red flag in front of a bunch of bulls," says Galloway. The domestic violence prevention group was so frustrated that it actually left the CoC, forfeiting access to federal funding from HUD in the process.

By March 2004, the situation was desperate. Realizing that the project was on the brink of collapse, Stratton, Human Services' IT manager, decided to hire a project manager. Because of the growing sentiment against the county, Stratton wanted to bring in someone independent, outside the county. He settled on Phil Conen, an independent IT consultant with a British accent that seems hopelessly out of place in North Carolina.

At the first CoC meeting, Conen just listened. The frustration was palpable. Conen announced that he was going to hold a meeting just to discuss confidentiality issues and asked each agency to send a representative. Twenty people showed up. During the four-hour meeting, Conen listened to people's concerns and translated computer security terms like permission-based access into plain English. Conen told the audience that the computer stores two pieces of information—who you are and



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_THE INVASION

_DAY 10: I...am...losing...my...mind. Too many servers. Too many operating systems. Too many databases. Nothing's integrated.

_I wish I had time for a nervous breakdown.

what you are allowed to do—and that the CoC could set whatever parameters it wanted for individual access to client information. At the end of the meeting Conen suggested that each agency make a list of all the types of information they thought should be considered confidential, and he said that he would take the list to the vendor to ensure that every concern was met.

Conen broke the information he received into 11 comprehensive categories, such as health, mental health, substance abuse history, job status and education. Softscape in turn designed the system so that information captured in each of these categories was a separate data element that could either be shared or not shared independently from the other 10 elements. A counselor at the agency the homeless person first visits captures all the information on an electronic intake form, but then the client—the homeless person—decides which information to share with which agency. For example, someone who didn't finish high school could elect to share education information with a GED program, yet keep their medical history private; all he would have to do is click the boxes next to the data he wants to share and the program with which to share it. The same person could choose not to share education information with any other agency. All the data in the system could also be stripped of identifiable information and used by organizations to run reports or spot trends, preserving one of the key benefits of the shared system.

In order to further reassure the CoC members, both Wake County and Softscape signed a contract promising that unauthorized users would not be able to access identifiable data. The CoC finally had a confidentiality model it could work with.

Over the next 28 days Conen held 33 meetings with CoC members on many other topics ranging from case management to shelter intake. The meetings were held at different agencies—a couple meetings took place in an affordable housing developer's garage—in order to further establish that this was a CoC project. It also allowed Conen to make a personal connection with the agency staff and clients, and permitted members of the CoC to see how their peers worked before they started collaborating through the system. Whenever Conen introduced a topic area, he would work with the group to develop a common definition for the term in question and use that definition going forward. As with confidentiality, he let the group develop the requirements and made the vendor redesign the system accordingly. The HMIS contract included time for design revisions, so the vendor was willing to make the changes without charging more.

The Keys to Collaboration

1) Bring out the skeletons in the closet. Collaboration projects don't fail because the technology supporting them isn't good enough. To the contrary, the technology is almost always the easy part. Organizations may appear to have good relationships on the surface, but when they begin to share information, whatever lingering tension exists among them will come out. Everyone's first instinct will be to blame the system rather than confront the source of the tension head on. CIOs and their project managers need to draw these issues out and address them head on.

2) Design the system around the group's needs. This is a bigger version of the ERP problem, where users resist changing their business processes to fit a system. Whereas a CIO (or at least the company) can force an employee to use a system or follow a method, no organization can force another to do so if a collaboration project is truly one of equals. By taking the time up front to understand each organization's business processes and building a new, collaborative process that retains the parts that each partner feels are most important, CIOs increase the possibility that organizations will actually use the new system.

3) Make every party feel important. If multiple parties are going to collaborate, it is important that no one group take over—even if it is by far the biggest or is footing most of the bill. Participants will drop out of the project if they begin to feel that it is serving one group's needs ahead of others. Small steps can help ease these feelings; consider hiring an independent project manager and spreading the meetings across all of the partners' offices.

—B.W.

The Road to User Friendly

ON the outskirts of Raleigh, a converted warehouse serves as the South Wilmington Street Center, a men's shelter that helped 1,895 men in 2004. It sits across six lanes of traffic from an adult bookstore. Homeless people start to congregate outside the shelter around noon. Doors open at four. Workers have to check in and assign beds to up to 234 homeless people each evening—more when the temperature drops below freezing. On those nights, meeting rooms and the cafeteria are converted into emergency dorms using mats.

Carson Dean, director of the center and chair of the CoC's HMIS subcommittee, told Conen that the check-in process had to be fast, and Softscape's developers came up with something they called quick check-in, which took about 30 seconds. It wasn't fast enough. The men in line are easily agitated. The staff



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checking them in also has to confiscate drinks, work tools and sometimes weapons, and explain why they can't hand out extra laundry tokens. Quick check-in using the system took hours and the software itself was difficult to maneuver. "It took four or five screens," says Dean. "We needed something like two screens."

Conen decided to bring the Softscape developers to the shelter to watch the check-in. "It was eye-opening," says Doug Wright, Softscape's VP of professional services. His team redesigned the system so that it took only two steps: Enter the name, click on a bed number. Pop-up alerts notify a worker if there is new information about the client, if he has mail or if he was involved in a violent episode the previous night.

The HMIS has been in place for more than a year now, and members of the CoC say that it has not only saved them time and money but has improved the level of care that they provide. Most obviously, the system has helped Wake County retain millions of dollars in annual HUD grants that it may otherwise have lost. The HMIS also generates reports in seconds that would

wouldn't have seen it otherwise."

Bringing area hospitals onboard with the HMIS will also help reduce the cost to care for the county's homeless. Hospitals don't like to discharge people who don't have anywhere to go, so the homeless often end up spending more nights in public hospitals than their condition warrants, and hospitals charge the county for that free care. When the hospital comes online with the HMIS, it will be able to reserve a shelter bed for a patient and discharge him more promptly to the shelter. (A night at Dorothea Dix Hospital costs the county \$594, compared with \$23 a night at the South Wilmington Street Center.)

There are still issues to resolve. The domestic violence agency has not rejoined the CoC. And no one has figured out a model that will allow runaway minors to legally consent to sharing their personal data, since they can't get parental permission. And there remain a handful of agencies in the Wake County CoC that do not use the system.

The CoC also put off resolving one big issue: who pays for the HMIS. The county and the CoC were happy to foot the initial bill,

There are still issues to resolve. No one has figured out a model that will allow runaway minors to legally consent to sharing their personal data, since they can't get parental permission.

take individuals up to 40 hours to prepare previously. This in turn allows users to spot trends.

At PLM Families Together, for instance, Galloway was able to generate reports showing that while 95 percent of the women who stay with his program for at least four months stay sober and eventually attain permanent housing, that rate dropped precipitously for women who have a child returned to them from protective custody. The mother may have had a substance abuse problem that caused the child to be taken away, Galloway explains. After several months in the program, once the mother has sobered up and stayed clean, the state may decide to return custody of the child to the mother. But that can cause other problems, particularly in families where an older child was taken into custody and the mother gave birth to another child when she was clean.

"When the older child sees how much better off the younger one is, he blames mom, and the whole family decompensates [falls apart]," says Galloway. Based on the information from the HMIS, the organization changed its policy and no longer allows reunions unless the family has attained permanent housing or passes a more careful screening. "The HMIS pinpointed this," he says. "We

while making it clear that the agencies that use the system would ultimately be responsible for its maintenance and user fees. In September the CoC voted unanimously to incorporate as its own entity, which will allow it to make payments and accept donations directly. "Six months ago everyone thought [the HMIS] was a ridiculous idea," says Galloway. But the HMIS has brought them closer together. Members of the CoC also say that the data they can derive from the HMIS—and the benchmarks and metrics that it will provide—will help attract private-sector donors who can now make contributions to a central organization.

In the meantime, Wake County has become a model for other CoCs implementing an HMIS. In New York City, Department of Homeless Services CIO Dilip Kulkarni says that his CoC—by far the largest in the country—looked at Wake County's HMIS before beginning its own project this year. And incidentally, the HMIS has helped the CoC get a better sense of its homeless problem. Between October 2004 and September 2005 the sys-

tem processed 4,100 unique homeless and at-risk individuals, nearly four times the number in last year's one-night count. **CIO**

Senior Writer Ben Worthen can be reached at bworthen@cio.com.

Working Together

To find out more about how to collaborate on complicated projects, read **A TRAVEL GUIDE TO COLLABORATION** in the online version of this story at www.cio.com/120105.

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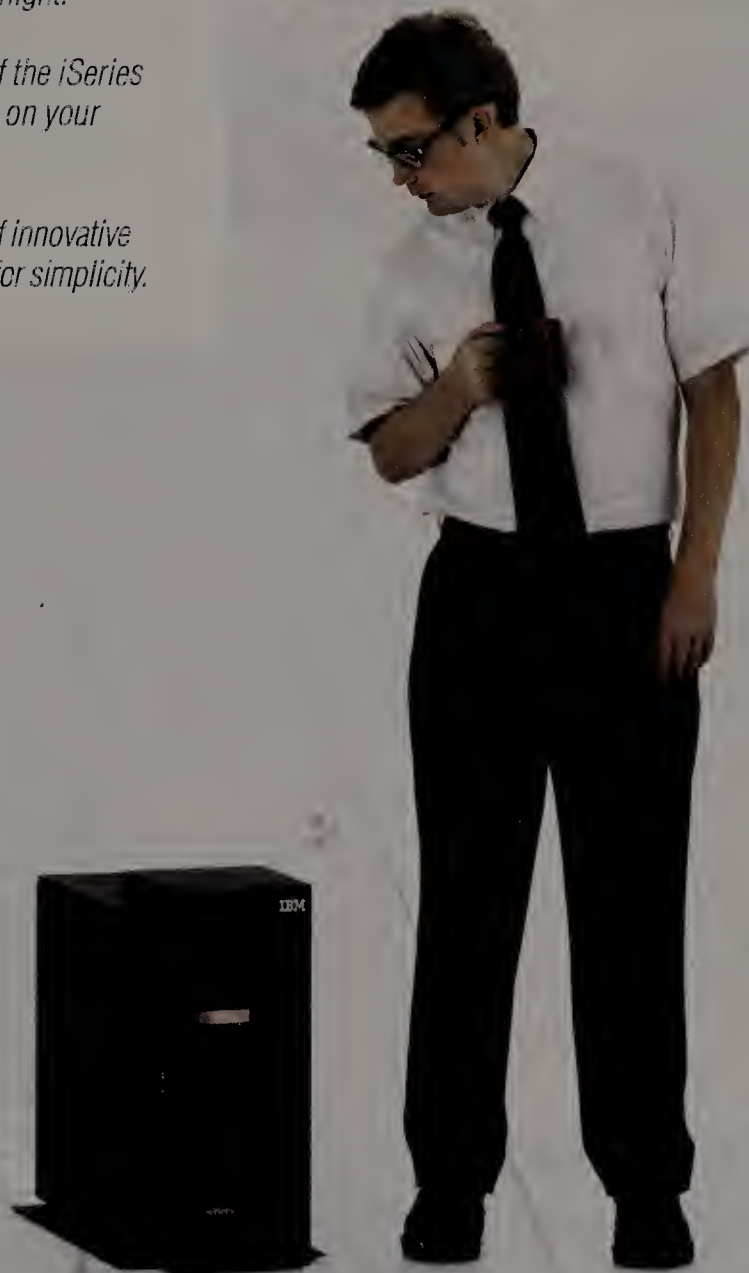
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Smart companies are moving into enterprise portfolio management, a more sophisticated approach to an old process. Retail giant Lowe's is using EPM to make decisions on everything from staff management to store openings.

BY CINDY WAXER

EPM helped Lowe's CIO **Steve Stone** evaluate the potential for expanding into Canada.



How Lowe's Grows

Reader ROI

- ❖ How portfolio management has evolved
- ❖ How Lowe's is using EPM to ensure that IT is aligned with business strategies
- ❖ How Lowe's is beginning to use EPM to make business decisions as well as IT decisions

When Lowe's developed a new cobranded credit card offering for its customers, CIO Steve Stone knew the project would call for a reconfiguration of the company's payment acceptance and processing systems. Not as obvious was where Lowe's would find the necessary internal manpower and skills to complete the project. That is, until Stone turned to Lowe's enterprise portfolio management (EPM) system for answers. By providing a companywide view of the company's IT activities, EPM helped Stone identify the necessary resources in other business units and reallocate them to support the North Carolina-based retail giant's new credit card program.

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Using portfolio management to get a better handle on resources such as human capital may seem ambitious, but it's all part of Lowe's plan to push the envelope on this mature, but still somewhat underutilized, technology. Rather than simply using portfolio management to prioritize IT initiatives as many companies do, Lowe's is leveraging EPM to perform business-critical tasks including anticipating labor shortages, planning operations expansions into Canada and gauging the effect of new systems such as self-checkout programs on how IT adds value to the business. Unlike earlier versions, which merely aggregated IT projects, today's EPM solutions are enabling businesses such as Lowe's to make both IT and non-IT decisions in accordance with a company's operating model, strategic direction and growth potential.

"What EPM allowed us to do with regards to [expanding store operations into] Canada is to understand what activities we had and where our resources would be available," Stone says. "EPM allows us to comparatively look at the value of IT efforts and to look at resource loads to better understand when we can execute a project. It allows us to be more flexible to the business than we've ever been before, and that's something that's hugely valuable to us."

The Misuse of Portfolio Management

While Lowe's is still in the process of fully realizing EPM's full potential, the company is still a step ahead of many of today's portfolio management users, according to analysts who track the systems. Although U.S. IT spending is expected to grow 7 percent this year, Info-Tech Research Group says 95 percent of IT groups are not delivering some projects on time or to the full satisfaction of business executives. Many companies have not even taken the first step in making the most of portfolio management; instead they continue to keep track of ongoing projects with Excel spreadsheets—an outdated tool that doesn't allow for frequent updates or collaborative input.

Then there are those that continue to view portfolio management as a static inventory of approved projects. Rather than giving careful consideration to the impact of technological and corporate fluctuations, these companies simply regard portfolio management as a onetime-only prioritization strategy. "If you look at older approaches to portfolio management, almost all of them stopped once projects were either funded or completed. To me, that was always absurd," says Robert Handler, a research vice president at Gartner and coauthor of *IT Portfolio Management Step-by-Step: Unlocking the Business Value of*

LOWE'S

Headquarters: Mooresville, N.C.

2004 sales: \$36.5 billion

Employees: more than 175,000

Stores: 1,125

IT executive: Steve Stone, CIO



Technology. Handler says contingencies such as unanticipated maintenance costs and repairs can have a tremendous impact on a project's expected ROI.

Humble Beginnings

Although determined to take EPM that extra step, Lowe's initial foray into portfolio management was nothing out of the ordinary. Anxious to revamp Lowe's approach to IT planning and tracking and derive greater business value from its IT endeavors, Stone turned to portfolio management in July 2001. By managing IT endeavors in the same way a stockholder oversees financial investments, Stone hoped to gain visibility into a murky IT project pipeline and achieve a holistic view of the company's technological initiatives.

For months, Stone and Stephen Boerst, Lowe's manager of IT strategy and planning, carefully documented commitments, time lines and resource demands of every IT project in the works, from enterprisewide rollouts to routine hardware upgrades. Following this, they divided projects into five categories: mandatory, maintenance, enhancements, growth and innovation. Within each category, projects were prioritized based on criteria such as ROI, risk and resource requirements. Once prioritized, Stone and Boerst set benchmarks to measure the progress of each project throughout its lifecycle.

While creating a project inventory was a tactical first step, Stone knew that it wouldn't be enough to truly align IT initiatives



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with Lowe's ever-evolving corporate strategy. After all, prior to portfolio management, many of Lowe's funding decisions were based on superficial factors such as a presenter's persistence or PowerPoint expertise. "The quality of the presentation drove whether the project was accepted or not. So someone could do a great job presenting an awful project and it would get approved," says Stone, adding that presentations were delivered only once a year as part of the company's budgeting process.

Stone also recognized that inching toward EPM meant no longer leaving it up to IT personnel—each acting on behalf of a particular department—to vie for the allocation of corporate resources and funds. To bring about these significant changes in Lowe's operational procedures, Stone established two groups in late 2001: the Business Solutions Group (BSG) and an IT steering committee.

The BSG member then works with the department head to build a strong business case and financial justification for the proposed investment. The business sponsor then takes the business case to the IT steering committee for final approval.

Lowe's IT steering committee includes Lowe's chief executive officer, Robert Niblock, Stone and six other C-level executives. The committee meets every two months to review detailed project proposals. Decisions as to whether a project should be subsidized, scrapped or simply placed on standby are based on set criteria including a project's potential ROI, its alignment with corporate objectives, impact on internal processes and potential risks. Following each presentation, the IT steering committee votes on whether a project should be approved. Currently, approximately 85 percent of Lowe's proposed initiatives fail to receive committee approval.

LOWE'S IS LEVERAGING enterprise portfolio management to perform business-critical tasks, including anticipating labor shortages, expanding store operations into Canada and gauging the effect of systems on the company's bottom line.



The Next Step

Today, the BSG is made up of 85 staffers boasting a combination of project management skills, an in-depth knowledge of business processes and a keen understanding of technology and its impact on the bottom line. BSG members, most of whom are IT program and project managers, support all areas of Lowe's business, from store operations to human resources. They work closely with department heads to align projects with business objectives and to measure the impact a project may have on the company's ability to carry out other business initiatives. For example, if the HR division wants a new payroll system, it's up to a BSG member to evaluate such a system's drain on IT resources, cost requirements and impact on related business processes such as benefits enroll-

ment. Using Pacific Edge's portfolio management software, Lowe's now generates three portfolio status reports on a weekly basis. The first is a summary report that color-codes the state of Lowe's IT projects. Progress is measured by whether a project is within budget, on schedule and in keeping with its intended scope. While the first report offers a comprehensive snapshot of project performance, Lowe's second report outlines a project's delivery schedule with detailed explanations for changes in delivery

dates and analyses of how these changes might affect other processes or projects. Information is based on regular status updates provided by the company's program and project managers. But it's the third report that delivers the greatest impact on Lowe's internal operations by measuring resource loads across the

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entire company's IT portfolio. For instance, with a single keystroke, Stone can discover the funds, as well as the number of hours and employees, currently dedicated to a single IT project.

Taking Stock

This application of EPM is beginning to have a significant effect on enterprise-oriented activities such as resource management. Two years ago, Lowe's decided to make sweeping and immediate changes to the company's corporate credit program. Any program overhaul is likely to create ripples across the enterprise but previously, it would have been next-to-impossible to pinpoint those areas that might be affected in the process. With the help of Lowe's resource load report, however, Stone was able to identify a financial enterprise resource planning program and two point-of-sale initiatives that were delivering less value to the corporation than was promised by the reconfigured credit program. As a result, Stone pulled resources from these lower-priority initiatives and reallocated them to help with the retooling of the company's payment acceptance and processing systems.

Lowe's also uses its EPM system to assign job descriptions

But Lowe's is using EPM to drive deeper into the enterprise and to predict the need for non-IT workers as well. The company has started to keep track of its business process experts—employees that mostly reside outside of the IT department but are conversant in technological issues and whose role it is to oversee new project launches. By incorporating business staff into its portfolio of assets, Lowe's can determine if the company has the necessary personnel in place to handle upcoming projects.

Beyond IT Assets

Lowe's is using EPM to make non-IT decisions that hold serious implications for the company's growth and survival. Take, for example, recently announced plans to open six to 10 stores in the Toronto market in 2007. "Portfolio management and the concepts around portfolio management helped us in determining if it's right for us to look at a Canadian expansion," says Stone. Long-term plans include the potential for as many as 100 Lowe's stores in Canada.

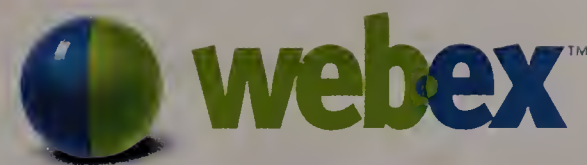
By providing a holistic view of the company's IT projects, Stone says Lowe's was able to measure an expansion's impact

FOR ALL THE BENEFITS OF PORTFOLIO MANAGEMENT, companies shouldn't expect to glean immediate results from it. In fact, experts suggest that it can take as long as five years to recognize real business value.



and skill sets to specific projects. By tracking the availability of internal skill sets and matching human capital requirements to new IT initiatives, Stone believes that by early 2006, the company will be able to forecast what particular IT skills are needed to complete a project and whether those skills are represented in the company's current IT talent pool, thereby driving hiring initiatives. "If we can understand a quarter or two in advance which roles we're in demand of, we can either hire internally or go to the external markets for those particular roles," says Boerst.

on available resources. After all, penetrating the northern border means dedicating personnel to the processing of multiple currencies, the introduction of new merchant programs, the deployment of back-office systems and cross-border merchandising projects. Because upgrading systems for multilanguage and multicurrency functionality demands the assistance of internal subject matter experts, Lowe's ran various scenarios through its EPM system to determine a manageable growth rate for expansion. In the end, the EPM solution illustrated that internal experts would be a "constrained resource" in the



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coming months—a revelation that Boerst says served as a valuable “reference point” in planning Canadian store expansion.

EPM also played an important role in setting a deployment pace for Lowe’s self-checkout initiative. The company recently completed a pilot project in which Lowe’s installed self-checkout lanes in five of its stores. Additional plans include installing self-checkout facilities in another 50 stores by the end of the

model and hosted training sessions to familiarize employees with the company’s new IT operating model.

Despite all the hours invested in change management processes, Stone says that virtues such as patience and consistency eventually helped EPM sell itself to employees. For example, in the past, IT project managers would have to fill out paper time reports on ongoing projects—a painstaking

EPM DETERMINED THAT the deployment of self-checkout technology called for extensive staff training. As a result, IT strategy manager Stephen Boerst says Lowe’s “could only roll out the self-checkout project as fast as store executives could set up their training programs.”



year. To determine the impact such an initiative would have on existing resources, Lowe’s again ran various scenarios through its EPM system to determine resource limitations. This time, EPM determined that the deployment of self-checkout technology called for the extensive training of in-store staff. As a result, Boerst says Lowe’s “could only roll out the self-checkout project as fast as store executives could set up their internal training programs.”

Culture Shift

For all the benefits of portfolio management, companies shouldn’t expect to glean immediate results from it. In fact, experts suggest that it can take as long as five years to reach the highest level of business value. This is because one of the greatest challenges companies face is responding to employee resistance. To help drive adoption, Lowe’s integrated portfolio management metrics into performance reviews for the company’s IT project directors and vice presidents. Compiled both midyear and end-of-year, these reviews outline which projects were delivered on time and on budget and include detailed explanations for missed targets.

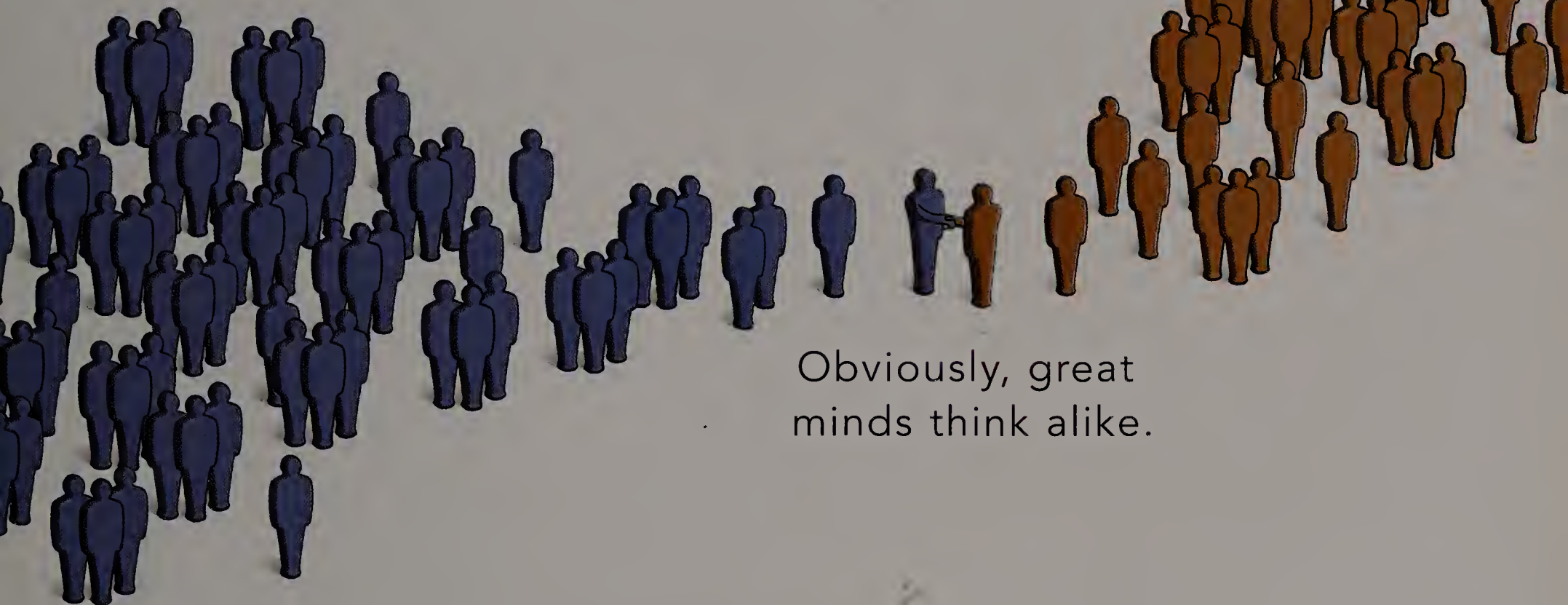
The company also enlisted the IT consulting services of Capgemini in July 2001. For nearly nine months, a team of third-party consultants helped define Lowe’s new IT operating

process that has since been simplified through the automated EPM system. Business executives have also learned to appreciate EPM’s benefits. By gaining greater visibility into IT resources, Stone says, executives now see the IT resource through the enterprise lens; they see the other efforts that are either under way or being planned.” Better equipped to make “more informed decisions,” these executives are now more likely to receive project approval and obtain the proper services from IT.

Lowe’s still has a long way to go before reaping all it can from EPM. Future plans include tracking the skills and hours of some non-IT employees through the system so that the company can take a broader approach to resource management and gain a clearer view of a project’s overall ROI. And only recently has Lowe’s begun to incorporate recruitment strategies into EPM by predicting the need for business process experts to oversee new project launches. But one thing is for certain: With business growing at a rate of 18 percent per year, EPM is Lowe’s best chance for taking IT and non-IT initiatives in the right direction. **CIO**

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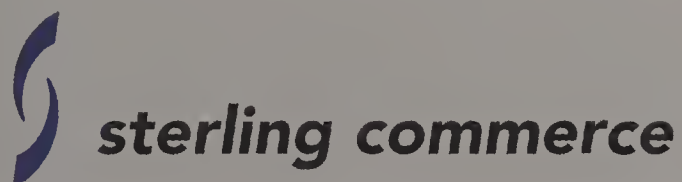
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How to Tackle Identity and Access Management

A chain is only as strong as its weakest link. And at many companies, when it comes to IT security, the weakest link is identity and access management. Ideally, a company would have an automated process for doling out application access—and for yanking that access once an employee leaves. Employee identities would be synchronized across all systems, and technologies would enable companies to trust the identities of suppliers, business partners and other outsiders who need secure access to their systems.

But the reality in most companies is far from ideal: Terminated employees may still have access to sensitive systems for weeks because the system admin never saw the termination e-mail from HR. Employees burdened by having to remember multiple passwords write them on sticky notes and slip

them under their keyboards.

CIO Executive Council members met in August to share advice on ironing out policies and processes for identity-management projects, prioritizing their efforts and how to get funding. Here are some of their tips.

1] Make the case with hard and soft benefits. Be prepared to educate business partners about identity and access management—what it is and why it is important. “It’s a very nebulous area to someone outside IT,” says Bruce Metz, CIO of Thomas Jefferson

University. “One challenge is to have people understand what you’re trying to do. Then, the second question is, ‘Why does it cost so much?’”

Members who’ve successfully secured funds for their identity- and access-management projects say the secret is in staying away from the nitty-gritty details of single sign-on, smart cards and other elements of security infrastructure. “Keep this from becoming a techie exercise,” says Keith Glennan, VP and CTO at Northrop Grumman. “Anytime you’re doing something that’s essentially an infrastructure project, you have to explain clearly what you’re trying to accomplish in business terms.”

Glennan made his case by showing that new ID-management systems would reduce IT administration and help-desk costs (by reducing the manual hassles of resetting passwords and

Continued on Page 108

Role Call

Find out who Bruce Metz, CIO of Thomas Jefferson University, says you should have on your ID-management team at www.cio.com/120105.

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[ONE::LINER]

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—MARTIN GOMBERG, VP AND CTO, A&E TELEVISION NETWORKS

[Describing a U.K.-based business partner’s objections to Gomberg’s reluctance to establish a trusted relationship between their companies’ networks]





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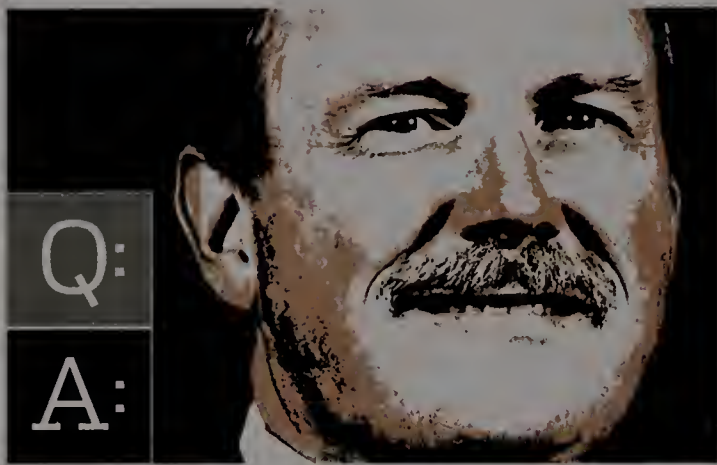
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How do I make the trade-off between ease of access to resources and user happiness? Is it possible to have a highly secure environment without overburdening users?

Security should never be a burden on employees or prevent them from doing their jobs. Unfortunately, many employees do not differentiate between their machines at home and their machines at work. Employees, who probably have authority over writing a check at home, still understand and tolerate the need for process and approvals when they request a purchase order at work. But they are often less tolerant of the need for business process and approvals of their computer activities. Computer assets are often seen as expendable because the value is often intangible.

So is a highly secure environment possible without being a burden on users or hindering their ability to do their jobs? Absolutely! Is it possible to have a highly secure environment without the appropriate business practices that control the use of your computer assets? No.

The key is education: If users understand why security is important, it's much easier for them to grasp how having a secure environment helps the company. Make them part of the team that comes up with the solution. You can't do that for every employee, but you can do an internal marketing campaign to help them understand why IT security is so important and what role they play in maintaining security.

—Steve Strout, CIO,
Morris Communications

Identity/Asset Management *Continued from Page 106*

assigning application access). Security would improve (no more sticky notes with passwords under the keyboard), and so would user productivity (since users wouldn't have to repeatedly log in to multiple systems). And Glennan points out a soft yet exceedingly important benefit: being better prepared to enforce compliance with regulations and demonstrate that compliance to Sarbanes-Oxley auditors.

2] Pilot the processes, not just the technology. CIOs who've begun identity-management efforts say that business-process issues present bigger hurdles than the technology. Steve Strout, CIO at Morris Communications, advises peers to walk through processes and rules related to identity creation and resource access before hardening those processes into code: Who is able to create, modify and view employee IDs? What is the trigger for giving a new employee (or an employee changing jobs) access to systems—and for revoking access when an employee leaves or changes roles? “We spent a lot of time walking through the logic behind why we were doing things a certain way,” Strout says. His project team (which included representatives from HR, IT and finance) created a new business process: When a user successfully passes the company's mandatory drug test, it serves as the trigger for creating and then enabling systems access.

3] Plan on customization. To achieve the full benefits of ID- and access-management tools, Strout says, most IS shops will have to do some customization, especially if they want to enable automated provisioning and single sign-on to legacy systems, homegrown apps, software from small startup companies and other nonstandardized systems. “The security designs aren't necessarily the same, so you just have to tackle each one as they are,” Strout says. In some cases, it may not be cost-effective to do automated provisioning to a nonstandardized system, especially if it has few users; it could make more sense simply to generate an automatic e-mail to an admin requesting systems access and have the admin manually fulfill the request.

4] Protect yourself against industry consolidation. While Strout was evaluating vendors for his identity-management initiative, the industry consolidated right before his eyes. Netegrity was bought late last year by Computer Associates. And earlier this year, after Strout had committed to buying an identity-management suite from Oblix, Oblix was bought by Oracle. “We're predominantly a Microsoft shop,” Strout says, and he wonders if future iterations of the Oblix ID-management suite will remain Microsoft-friendly.

His strategy for dealing with the uncertainty: “Build processes in a standardized way.” That way, if he has to move to a new technology, he'll minimize the amount of re-architecting that he needs to do.

Sari Kalin is a freelance writer based in Arlington, Mass. Send comments about this story to casselin@cxo.com.

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CASE STUDY

NORTHROP GRUMMAN

A step-wise approach to identity management

How do you launch a multimillion-dollar identity-management effort at a company that has 129,000 employees in seven business sectors, spread across 50 states and 25 countries? For defense contractor Northrop Grumman, the answer is simple: one well-planned step at a time. "We think it's better to take a somewhat measured pace and minimize the risk of disruption, rather than go for a big bang," says Keith Glennan, VP and CTO.

About a year and a half ago, Northrop Grumman began looking into identity-management systems to improve security, facilitate regulatory compliance, make it easier for users to log on to multiple systems (without using multiple passwords), and reduce the cost of provisioning and password-management burden on IT. Glennan's team ran a pilot with a few hundred users across the company in early 2004. In addition to automated provisioning, the pilot also used smart cards and linked user network log-ins to application log-ins.

The pilot was successful on two fronts: It showed how identity management could make life easier for users and for IT, and it highlighted identity-related policy issues that needed to be ironed-out before such a system could be implemented companywide.

"Policy is at least as big a challenge as the technology, because you have to make a lot of decisions about what rules you're trying to enforce," Glennan says. "It gets into cross-functional jurisdictional issues in terms of who can create identity, what is the authoritative source of identity within the company, and how you deal with outside people who need access to your systems."

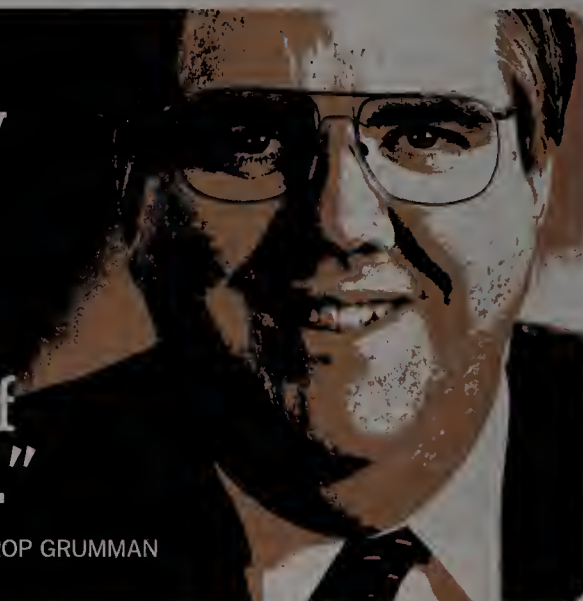
When the pilot was completed, a steering committee that included representatives from HR, IT and security debated

policy issues. They decided to make the HR system the authoritative source of identity so that it would drive the identity-management process, including e-mail provisioning. "Effective identity management requires the elimination of multiple points of identity creation," Glennan says.

So-called single sign-on is not really Glennan's goal. "We're using the term 'reduced' sign-on because single sign-on misses the point of linking the objective to business value," he says. "We're interested in single sign-on for applications that really make sense to have single sign-on, in terms

"Effective identity management requires the elimination of multiple points of identity creation."

—KEITH GLENNAN, VP AND CTO, NORTHROP GRUMMAN



The team also decided that Northrop Grumman's procurement organization will create identities for suppliers and business partners that need access to the company's systems. (In the future, Northrop Grumman plans to move to a federated identity-management architecture to ease the process of working with suppliers and business partners not on its network.

Glennan plans to re-architect directory services and to roll out an automated provisioning capability, which will take about 18 months. Once the infrastructure is in place, he says, his team will work its way through Northrop Grumman's entire application portfolio, prioritizing which apps should be linked to the identity-management system for user provisioning and sign-on. Apps with the largest number of users will be enabled first, and those with only a few users may never be enabled.

of saving time and improving security."

Northrop Grumman's identity-management road map looks like a ski slope with two parallel tracks, one charting the rollout of core directory services infrastructure, the other showing the identity-management policy and procedures that will be enabled by that infrastructure. As the tracks wind their way down the mountain, enterprise value increases. The value comes from getting better time to provisioning, and better reporting and analysis for audit, compliance and so on.

Glennan urges CIOs embarking on an identity-management project to make sure they have a clear understanding of how identity management will drive enterprise value in their organizations. "Once you understand that, you can create your own ski-slope diagram that makes sense in your environment."

—S.K.



The CIO Executive Council is a professional organization for CIOs founded by CXO Media. To learn more about the Council, visit www.cioexecutivecouncil.com or contact Council General Manager and CXO Media CIO Mark Hall at mhall@cio.com or 508-988-6821.

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CASE STUDY

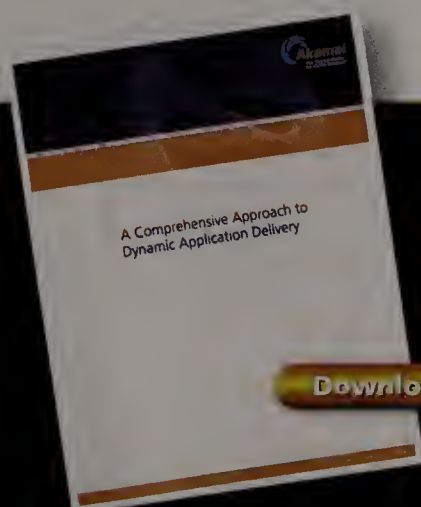


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—Scott Ohman, Manager E-Business Commercial,
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A Comprehensive Approach to Dynamic Application Delivery

There's No Place Like Home

There are good reasons for keeping tech jobs in the United States, but you need to do more than click your ruby slippers



It's time to do a bit of rooting for the home team.

With all the hoopla about tech jobs moving abroad and the allure that global sourcing holds for chief information officers, it is easy to imagine scenarios in which tens of thousands of tech jobs now located in the United States will find homes elsewhere on the planet.

Not so fast, says a U.S. Department of Commerce report, which lists a plethora of reasons why key tech jobs will stay in the good ol' USA.

A section of the report details nine factors favorable to the United States, including a stable nation/economy, strong data security/privacy protection/respect for intellectual property, reliable telecom infrastructure and software development benefits from market proximity to customers.

The report then cites 15 characteristics of IT work favorable for performance in the United States. Highlights of that list include work that crosses many disciplines, work that requires a high degree of personal interaction, work that requires non-rule-based decision making and work that requires high levels of creativity, innovation and insight. So, it seems, if the Department of Commerce is right, plenty of important tech work will continue to be conducted on these shores.

Equally encouraging in the long term is the recent SAT results that show improvement in math scores for American high school students.

But more work needs to be done. Every IT worker in America should feel a direct responsibility for cultivating an education and business environment favorable to future IT jobs. If we don't, the current and admirable focus on "no child left behind" will morph quickly and desperately into "no country left behind."

Drop me a note if you would like to see the full Department of Commerce list.

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BY BEN WORTHEN

THE ROAD TO HELL IS PAVED WITH GOOD INTENTIONS



The Laws of Unintended Consequences

LAW	INTENT	CONSEQUENCE	WHAT TO DO NOW?
Can-Spam 2003	Eliminate spam.	Spam now accounts for 65% to 80% of all e-mails.	Start mass e-mail campaign to repeal law.
Fair and Accurate Credit Transactions (FACT) Act 2003	Protect consumers from identity theft.	Since 2003, identity theft has quadrupled, with hackers stealing personal information, including credit card numbers and Social Security IDs, from millions of Americans.	Teach consumers to steal someone else's identity.
Federal Information Security Management Act (FISMA) 2002	Measure cybersecurity initiatives at 24 government agencies.	Government failed the test: Seven agencies received F's from the inspector general in 2004, and the average grade was a D+.	Grade on a curve?
R&D Tax Credit 2002	President Bush broadened access to this tax credit so more companies would invest in R&D.	The year 2002 saw the largest single drop in corporate R&D ever.	Increase those tax credits!
Cyber Security R&D Act of 2002	Called for dedicating close to \$1 billion for cybersecurity R&D over five years.	The Department of Homeland Security's 2005 cybersecurity R&D budget is \$18 million.	Pretty soon, we're gonna be talking real money.

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